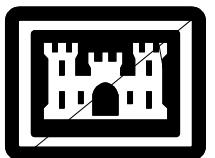


IFB W911WN-05-B-0002



US Army Corps
of Engineers
PITTSBURGH DISTRICT

FABRICATION OF EMERGENCY BULKHEADS

OHIO RIVER
EMSWORTH DAMS
ALLEGHENY COUNTY
PENNSYLVANIA

Contract Drawings
100% Submittal

17 JUNE 2005

CONTRACT DRAWING INDEX

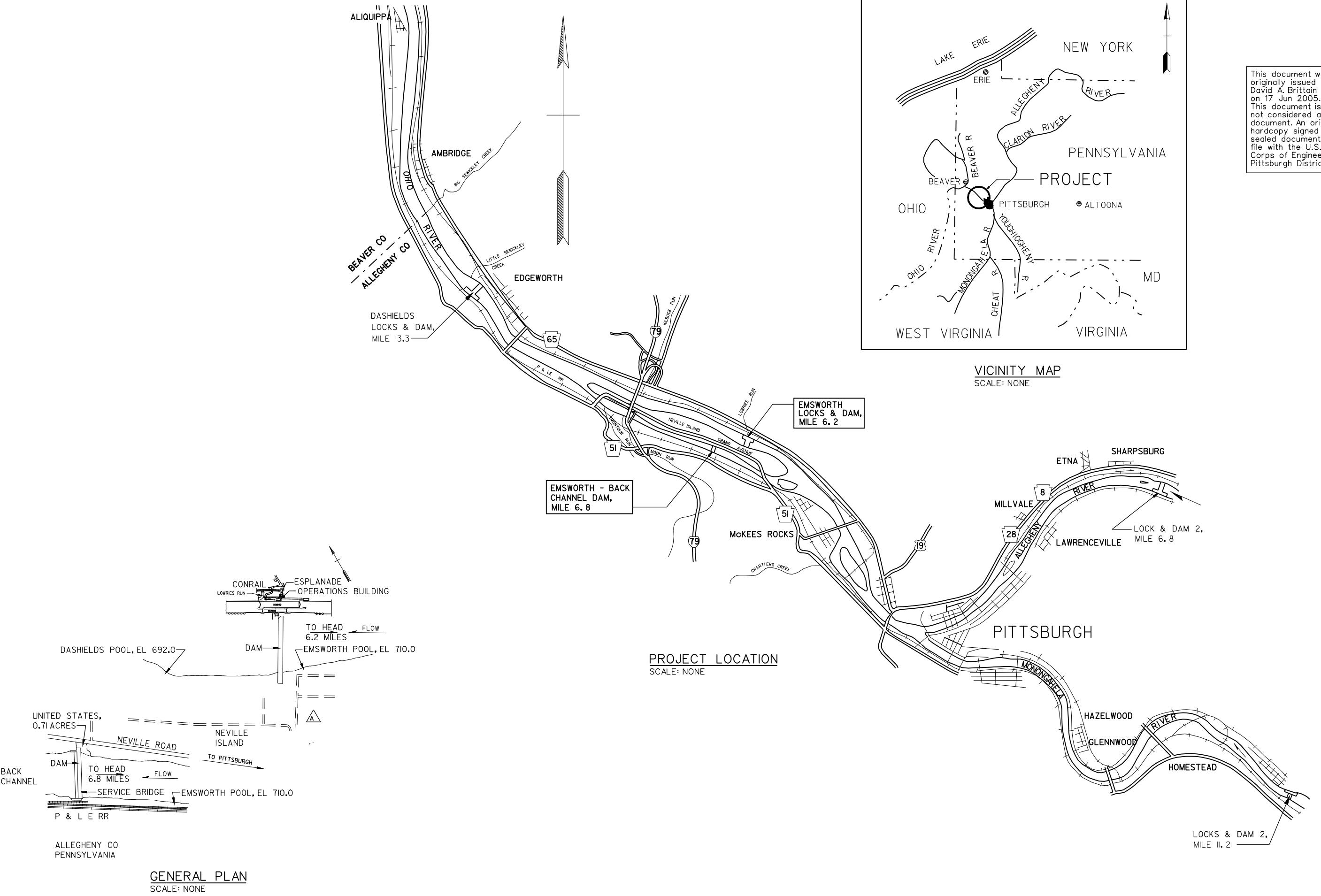
CONTRACT DRAWING INDEX	
TITLE	DWG NO
GENERAL INFORMATION	
COVER SHEET	
SIGNATURE SHEET	O-LEM-0/25
DRAWING INDEX AND GENERAL NOTES	O-LEM-0/26.1
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SECTIONS & DETAILS-FRAMING CONNECTIONS 3 OF 5	O-LEM-58/40.1
SECTIONS & DETAILS-FRAMING CONNECTIONS 4 OF 5	O-LEM-58/41.1
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A

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		US Army Corps of Engineers Pittsburgh District		
Submitted by: NDLZ 612 Hanley Road, Columbus, Ohio 43229		/s/ David A. Brittain SECTION CHIEF		
Design by:	CVP	Cbd by:		
Own by:	JAH	CDS		
Plot / Scale:	1:666671:000000	Submission Date:	FBI NO: W911WN-05-B-00002	
Pen. Table:	Sheet 3 of 30			
Color Table:	26a S01			

**OHIO RIVER
EMSWORTH DAMS**
FABRICATION OF EMERGENCY BulkHEADS
GENERAL INFORMATION
DRAWING INDEX AND
GENERAL NOTES



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/s/ David A. Brittain
SECTION CHIEF
FB NO.: W91WN-05-B-0002
Sheet 4 of 30

DL		CVP		<i>/s/ David A. Brittain</i>	
5121 Hattie Reed, Columbus, Ohio 43229		Dwn by: JAH		SECTION CHIEF <i>CDS</i>	
User Name:	barbara.c.torpus	Clkd by:		IBB No.:	W911WN-05-B-0002
Date:	2005-11-18	Submission Date:	17 JUNE 05	Revision Date:	
Phone:	0-66667-1000000	Ext.:		Ext.:	
Comments:	2001 SOI				
	Sheet 4 of 30				

A LAYDOWN AREA DELETED.
F:\Emsworth Dams Rehab\Bulkheads\100\General\OLEM_G

EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
GENERAL INFORMATION
PROJECT LOCATION AND
VICINITY MAP

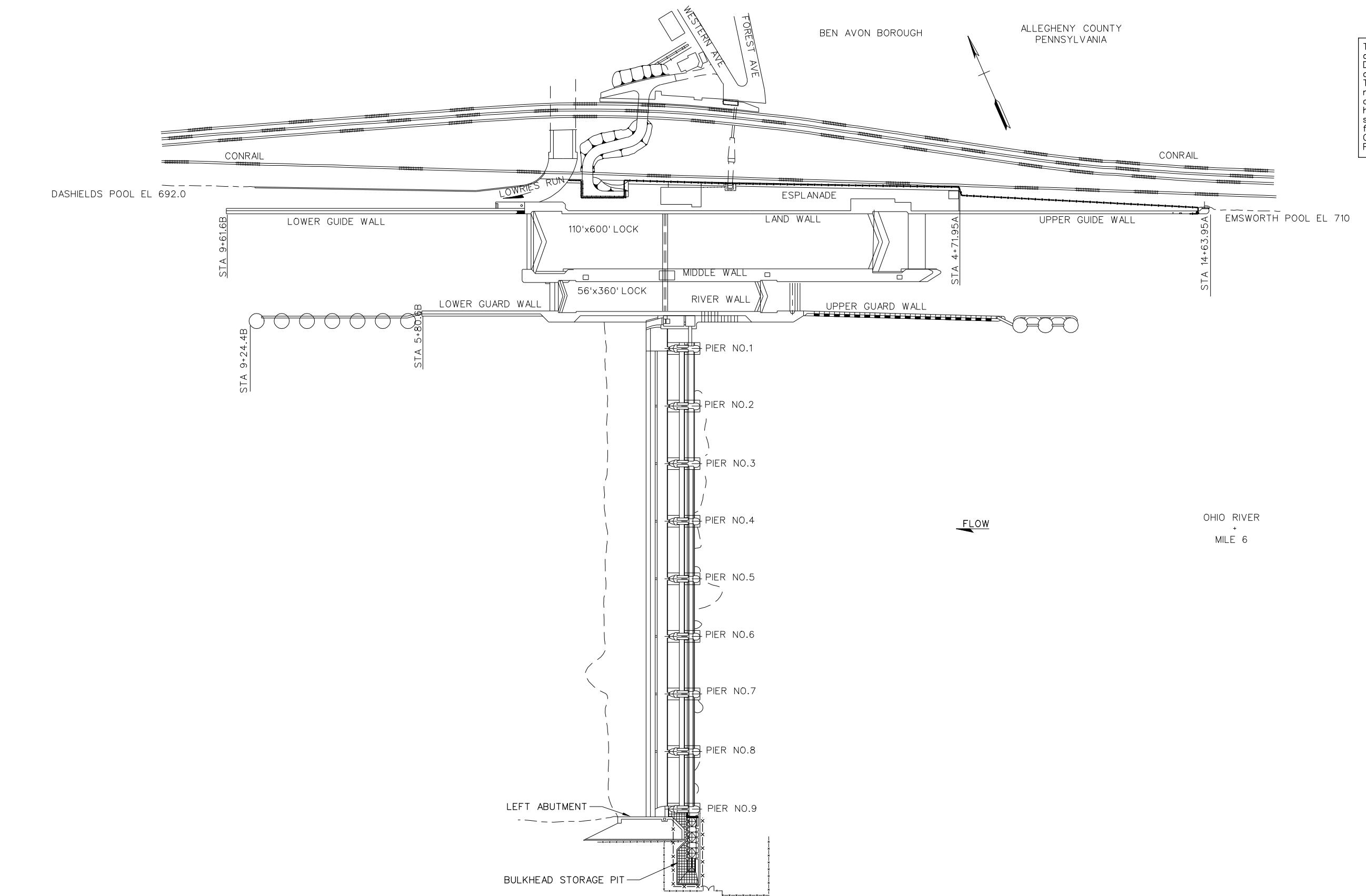


US Army Corps
of Engineers
Pittsburgh District

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Submitted by:
/s/ David A. Brittain
SECTION CHIEF

IFB NO.:
W911WN-05-B-0002
Sheet 5 of 30



Symbol	Description	Date	Apr.

OHIO RIVER EMSWORTH DAMS FABRICATION OF EMERGENCY BULKHEADS GENERAL INFORMATION PLAN					
C:\Emsworth Dams Rehabs\Bulkheads\100\General\OLEM_G-1					



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of Engineers
Pittsburgh District

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Submitted by:
/s/ David A. Brittain
SECTION CHIEF

Date: 17 JUN 05
IFB NO.: W911WN-05-B-0002

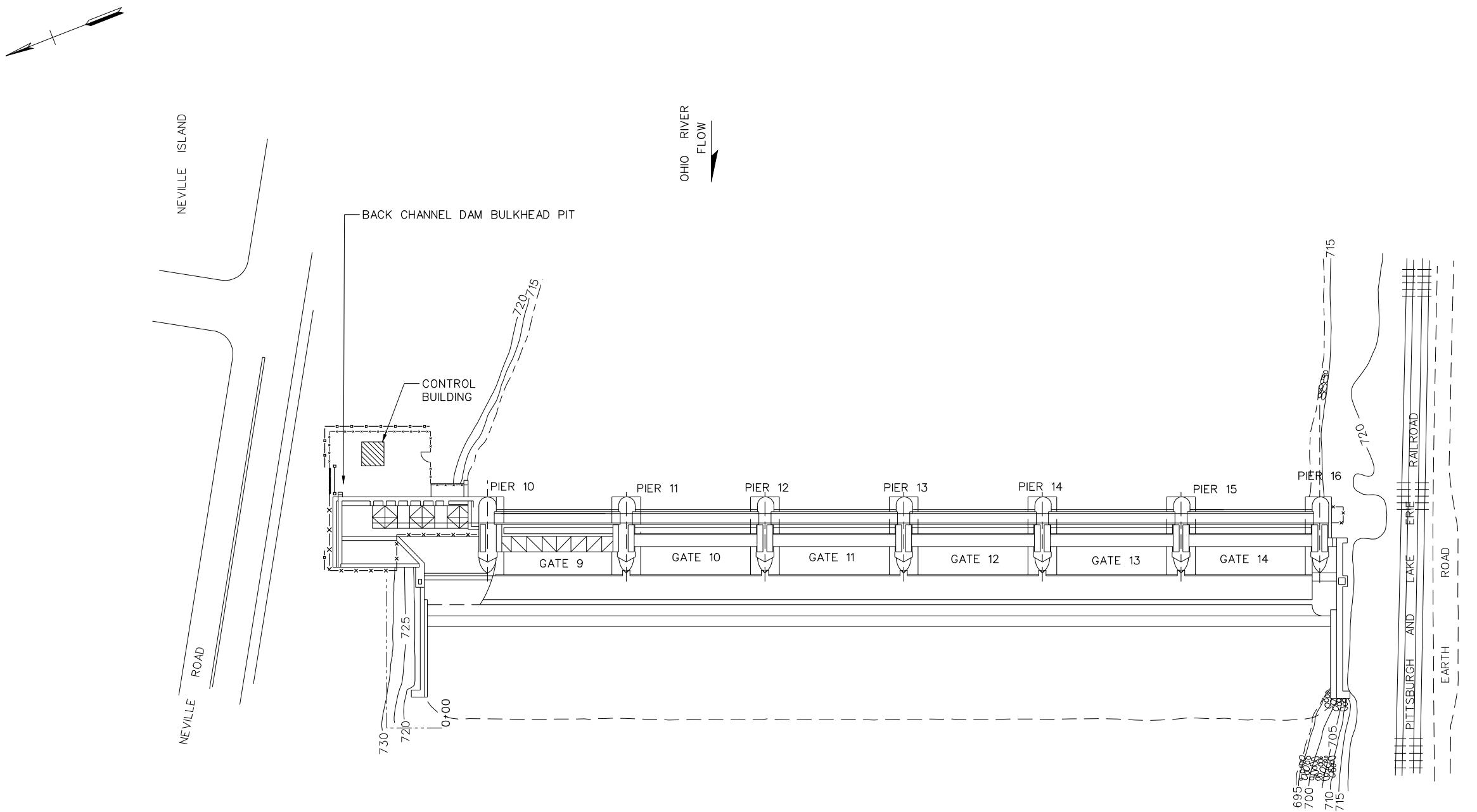
Revision Date: 17 JUN 05
Pen Table: Color Table

Sheet 6 of 30

Symbol	Description	Date	Apr.
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		Submission Date: 17 JUNE 05	Revision Date: 17 JUNE 05
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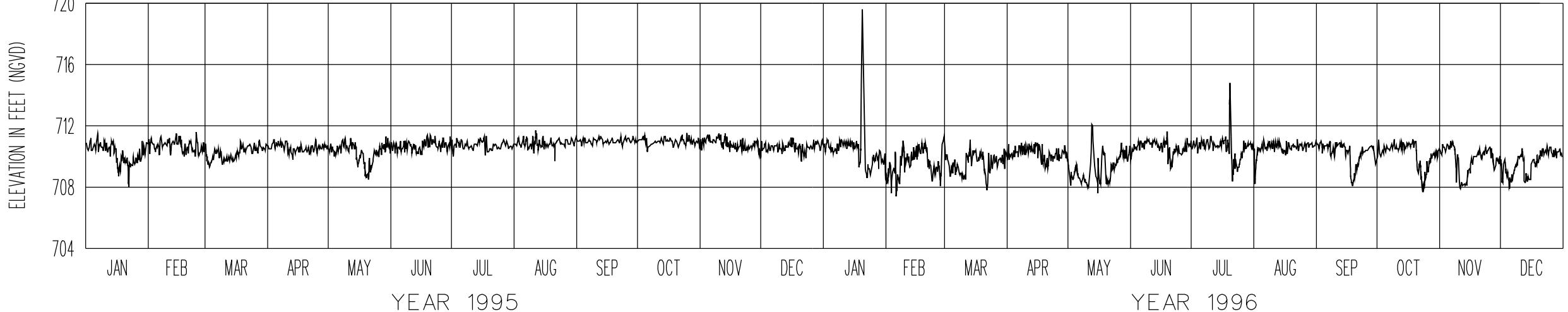
OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
GENERAL INFORMATION
PLAN
BACK CHANNEL DAM
F:\Emsworth Dams Rehabs\Bulkheads\100\General\OLEM_G-132a.S01

PLAN - BACK CHANNEL DAM
SCALE: NONE

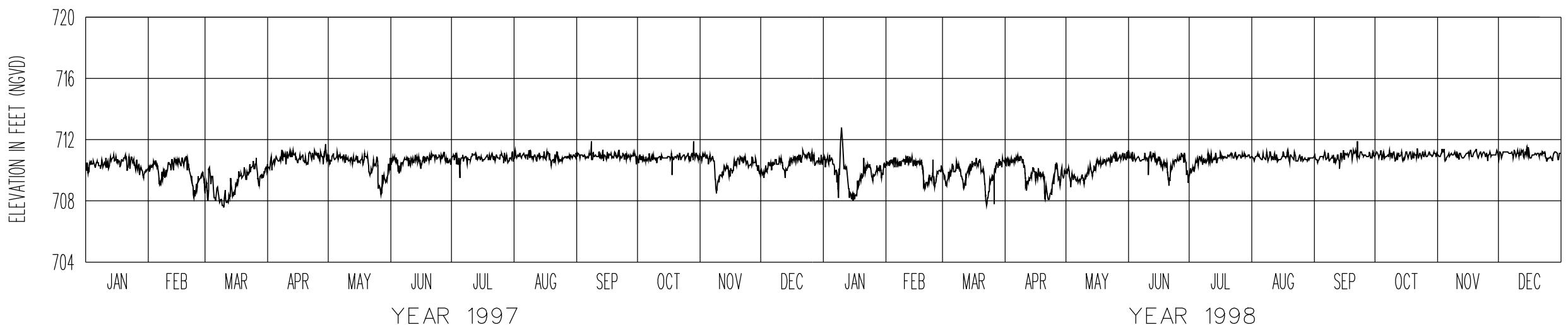




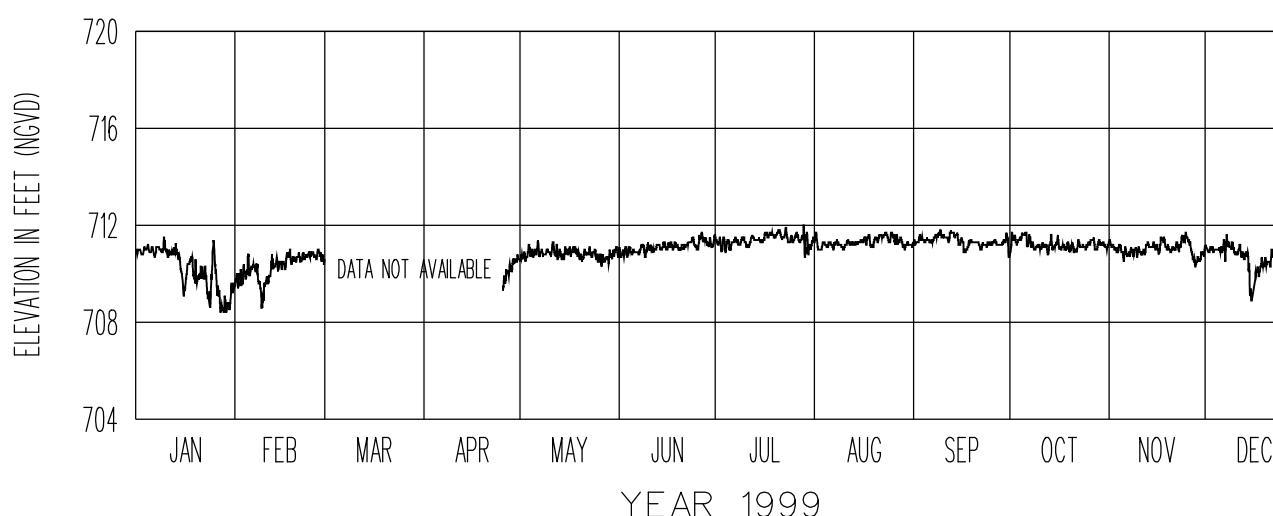
US Army Corps
of Engineers
Pittsburgh District



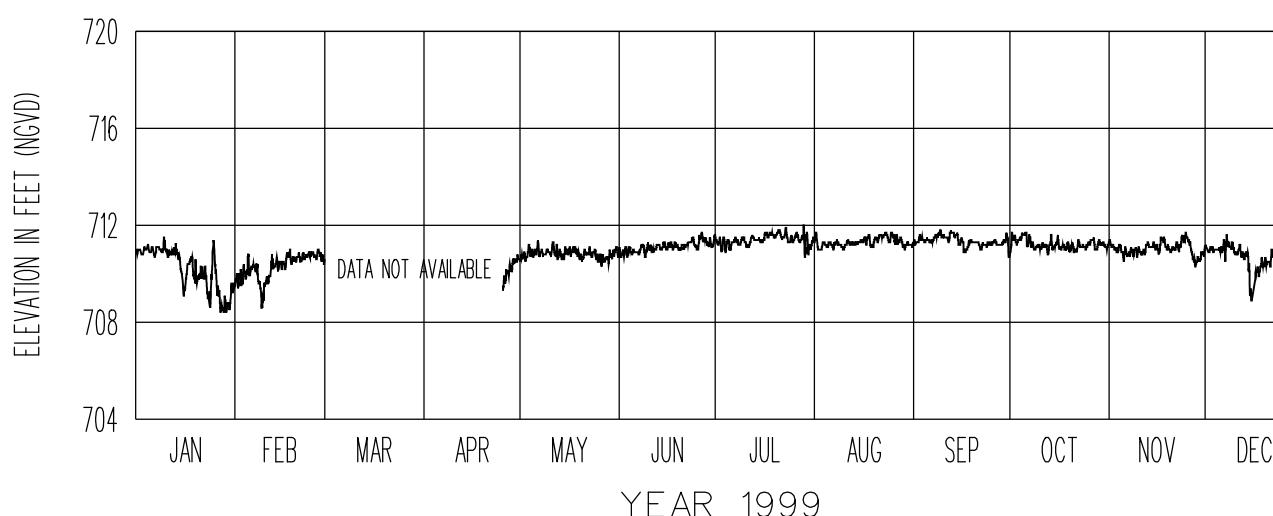
A



A



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A

GENERAL NOTES

1. HISTORICAL STAGE HYDROGRAPHS ARE BASED ON CORPS OF ENGINEERS RECORDS AT EMSWORTH LOCKS AND DAMS ON THE OHIO RIVER FROM 1995-2004. DATA IS PROVIDED FOR INFORMATION ONLY.
2. NORMAL UPPER POOL ELEVATION IS 710.6 FEET (NGVD) BUT MAY VARY DUE TO GATE OPERATIONS.
3. THE UPPER GAGE HAS A VERTICAL DATUM OF 694.2 FEET (NGVD).

OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
HYDROGRAPHS & DISCHARGES
UPPER POOL HYDROGRAPHS
1995-1999, INCLUSIVE
: Emsworth Dams Rehdb\Bulkheads\100%\General\OLEM_G-4.Dwg

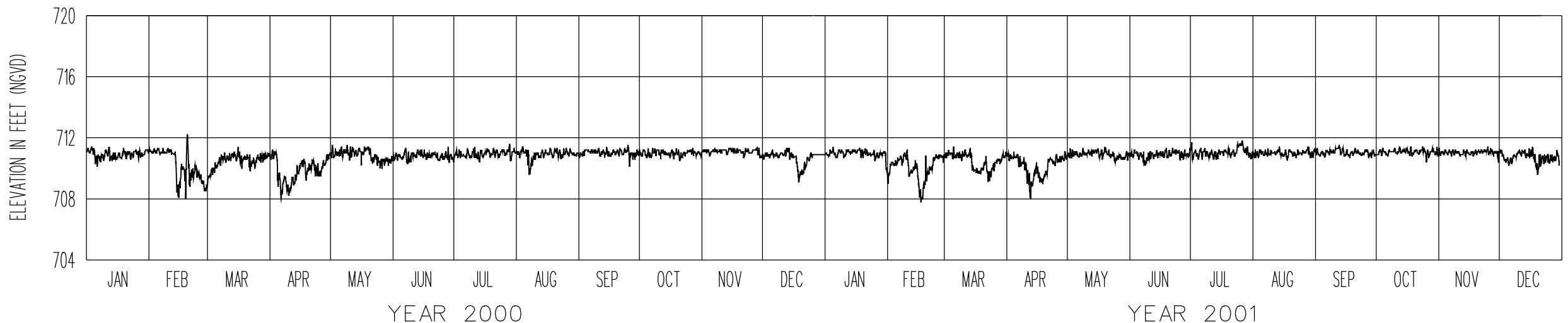
Drawing Number:
O-LEM-14/25.1

Design by:	Submitted by: /s/ PAULA G. BOREN, P.E.	
DAM	Crk by:	SECTION CHIEF
Own by:	JAK	
DAM	Submission Date:	IFB NO.:
Own by:	17 JUNE 05	W911WN-05-B-0002
Sheet 7 of 30		

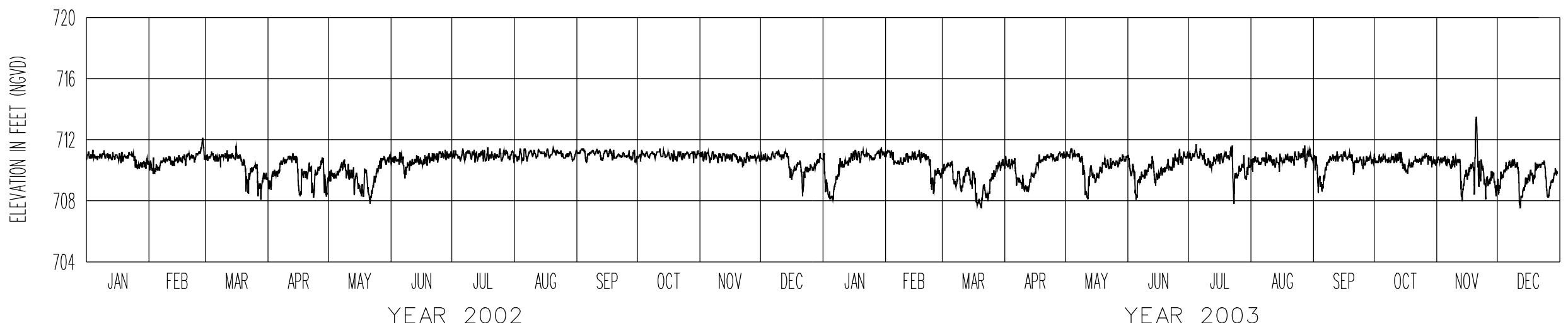
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User: borbarachiphins	Date:	18-JUN-2005 11:29
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: Emsworth Dams Rehdb\Bulkheads\100%\General\OLEM_G-4.Dwg		



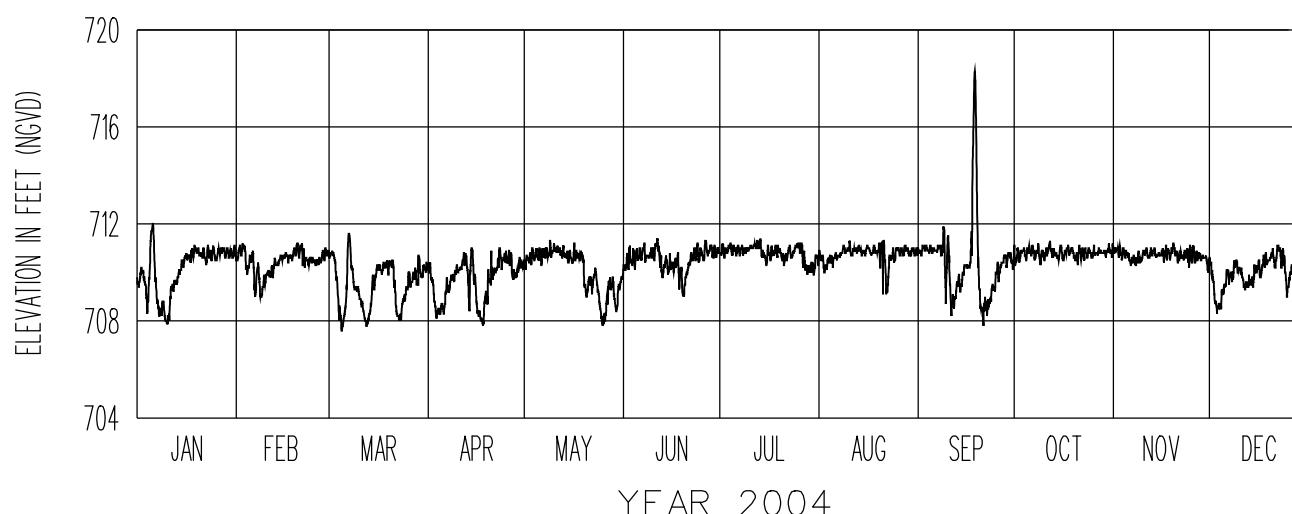
US Army Corps
of Engineers
Pittsburgh District



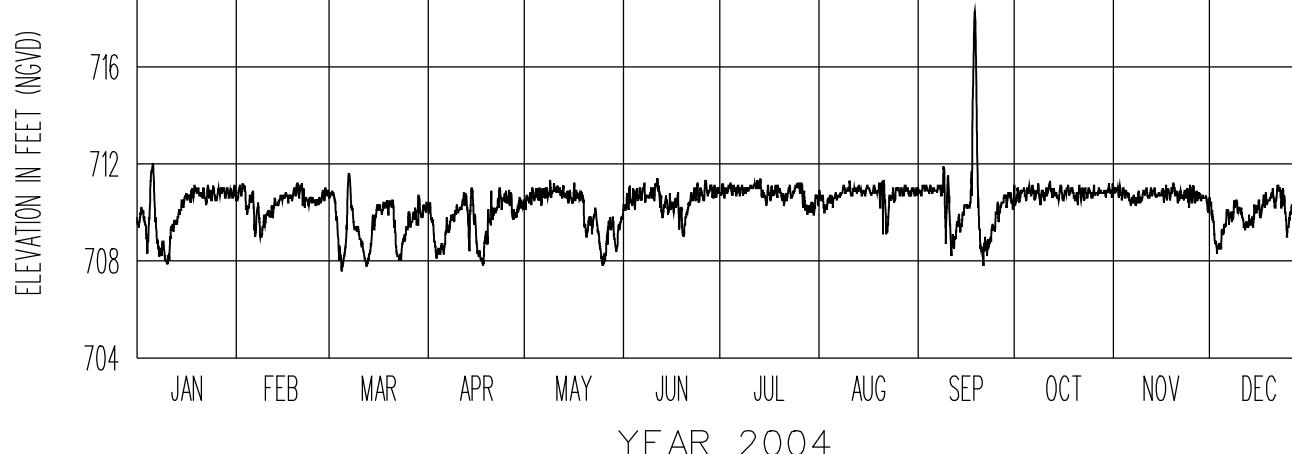
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▲



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GENERAL NOTES

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OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
HYDROGRAPHS & DISCHARGES
UPPER POOL HYDROGRAPHS
2000-2004, INCLUSIVE

Drawing Number:
O-LEM-14/26.1

Design by:	DAM	Submitted by:	/s/ PAULA G. BOREN, P.E.
Drawn by:	DAM	Cd by:	SECTION CHIEF
Date:	JAK	IFB NO.:	W911WN-05-B-0002
Submission Date:	17 JUNE 05	Revision Date:	
Sheet 8 of 30			

Symbol	Description	Date	Apr.

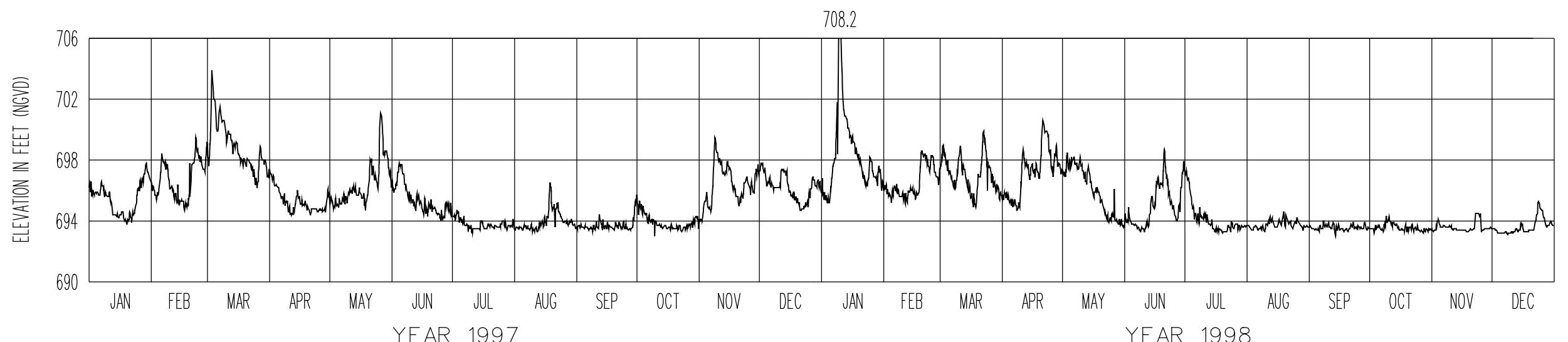
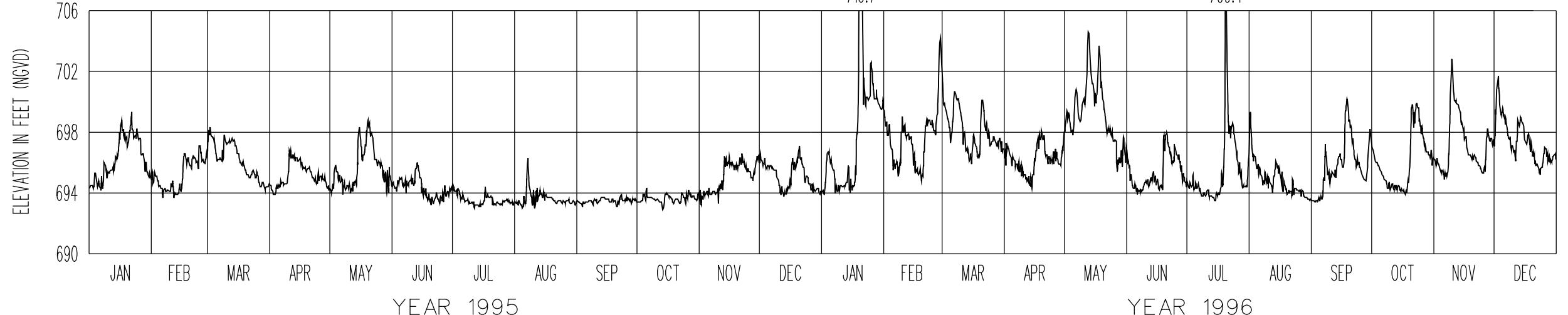
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Pen table:	17 JUN 05	RGB
Color Table:		
420x501		

A : Stage Data Revised.
: Emsworth Dams Rehdb\Bulkheads\100\General\OLEM_G-420x501



S Army Corps
f Engineers
ittsburgh District



GENERAL NOTES

1. HISTORICAL STAGE HYDROGRAPHS ARE BASED ON CORPS OF ENGINEERS RECORDS AT EMSWORTH LOCKS AND DAMS ON THE OHIO RIVER FROM 1995-2004. DATA IS PROVIDED FOR INFORMATION ONLY.
 2. NORMAL LOWER POOL ELEVATION IS 692.0 FEET (NGVD) BUT MAY VARY DUE TO GATE OPERATIONS.
 3. THE LOWER GAGE HAS A VERTICAL DATUM OF 680.0 FEET (NGVD).

**OHIO DIVISION
EMSWORTH DAMS**
FABRICATION OF EMERGENCY BULKHEADS
HYDROGRAPHS & DISCHARGES
LOWER POOL HYDROGRAPHS
1995-1999, INCLUSIVE

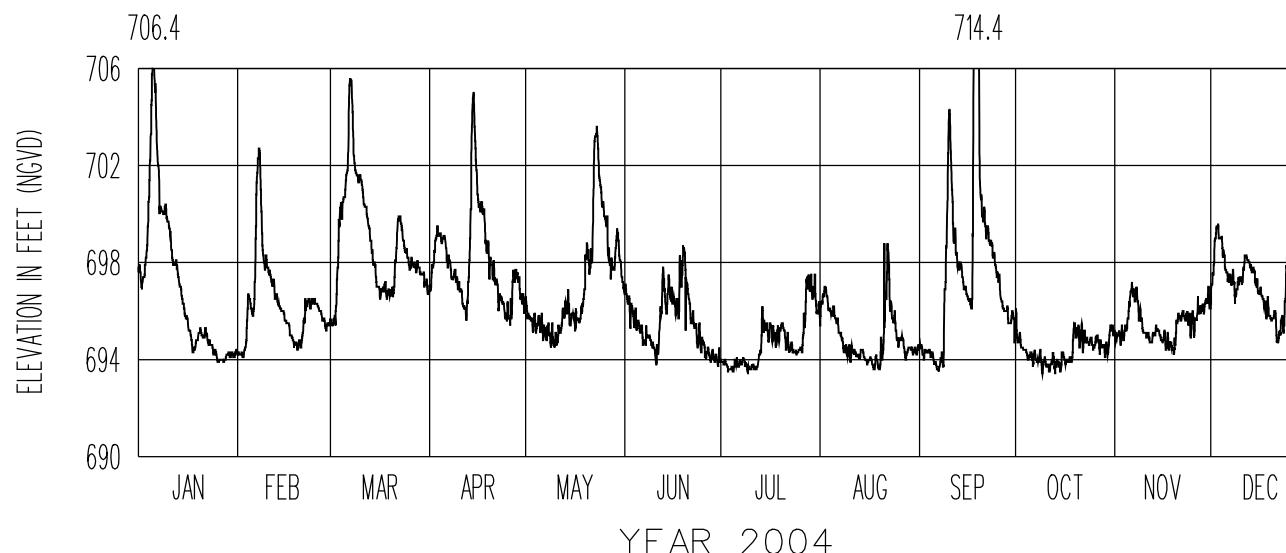
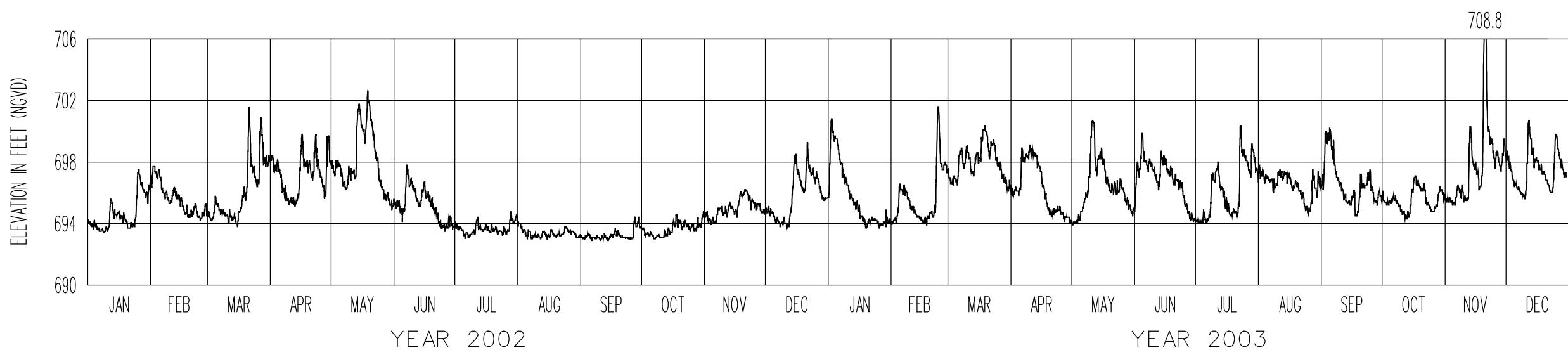
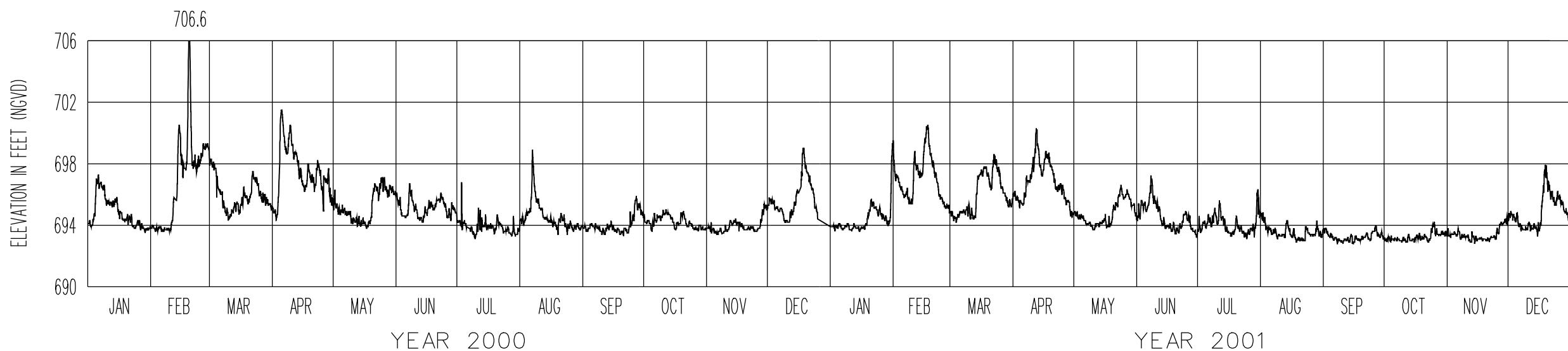
Own by:	DAM	Ckd by:	/s/ PAULA G. BOREN, P.E.
	DAM	JAK	SECTION CHIEF
Submission Date:	17 JUNE 05	Revision Date:	IFB NO.: W911WN-05-B-0002
			Sheet 9 of 30

6121 Huntley
User: barbara.e.h.
Date: 18-JUN-2004
Plot Scale: 0.166
Color Table:
PCB
d:\OLEM_G_47A.S01

**OHIO DIVISION
EMSWORTH DAMS**
FABRICATION OF EMERGENCY BULKHEADS
HYDROGRAPHS & DISCHARGES
LOWER POOL HYDROGRAPHS
1995-1999, INCLUSIVE



US Army Corps
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Pittsburgh District



GENERAL NOTES

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3. THE LOWER GAGE HAS A VERTICAL DATUM OF 680.0 FEET (NGVD).

Design by:	DAM	Submitted by:	/s/ PAULA G. BOREN, P.E.
Drawn by:	DAM	Section Chief:	
Checked by:	DAM	Date:	JAK
Approved by:	DAM	IFB No.:	
Submission Date:	17 JUNE 05	Revision Date:	W911WN-05-B-0002
Sheet 10 of 30			

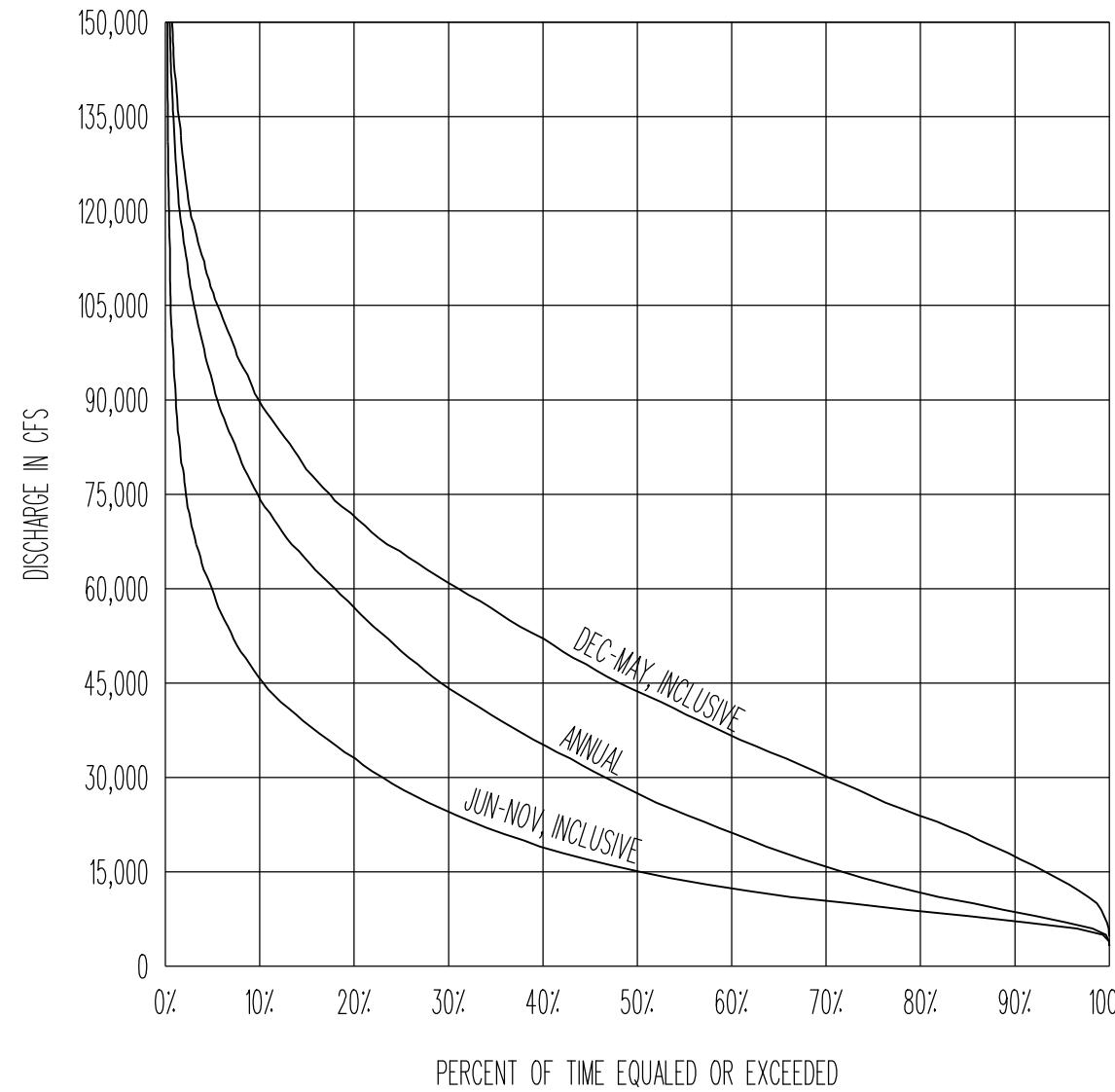
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User: barbara.hjephins	Drawn by:	
Date: 18-JUN-2005 11:29	Checked by:	
Plot Scale: 1:66667:1,000000	Approved by:	
Pen Table: Color Table 4		
17 JUN 05 RGB		
: Emsworth Dams Rehabs\Bulkheads\100\General\OLEM_G-428d.SSU		

OHIO RIVER	Description
EMSWORTH DAMS	
FABRICATION OF EMERGENCY BULKHEADS	
HYDROGRAPHS & DISCHARGES	
LOWER POOL HYDROGRAPHS	
2000-2004 INCLUSIVE	

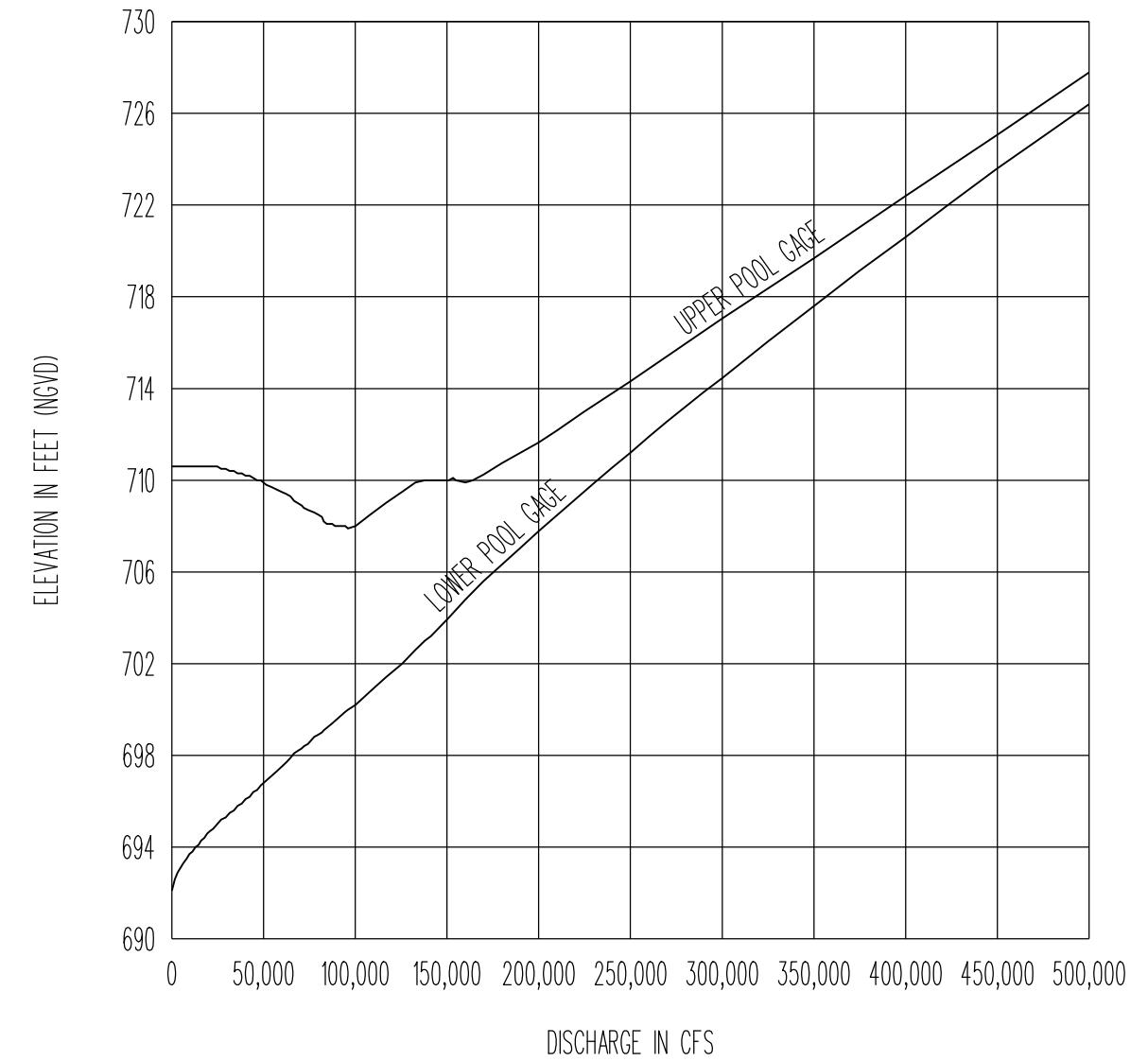


US Army Corps
of Engineers
Pittsburgh District

DISCHARGE VERSUS DURATION



POOL ELEVATION VERSUS DISCHARGE



GENERAL NOTES ▲

1. DISCHARGE VERSUS DURATION RELATIONSHIP IS BASED ON DAILY AVERAGE FLOW VALUES AT SEWICKLEY, PA (USGS-03086000) FOR WATER YEARS 1966 THROUGH 2004, INCLUSIVE. PROVISIONAL DATA FROM THE USGS WAS USED FOR WATER YEAR 2004

2. ELEVATION VERSUS DISCHARGE RELATIONSHIP IS BASED ON BACKWATER COMPUTATIONS, FLOW OVER WEIR COMPUTATIONS, AND MEASURED HIGH WATER MARKS.

3. DISCHARGE RELATIONSHIPS ARE PROVIDED FOR INFORMATION ONLY.

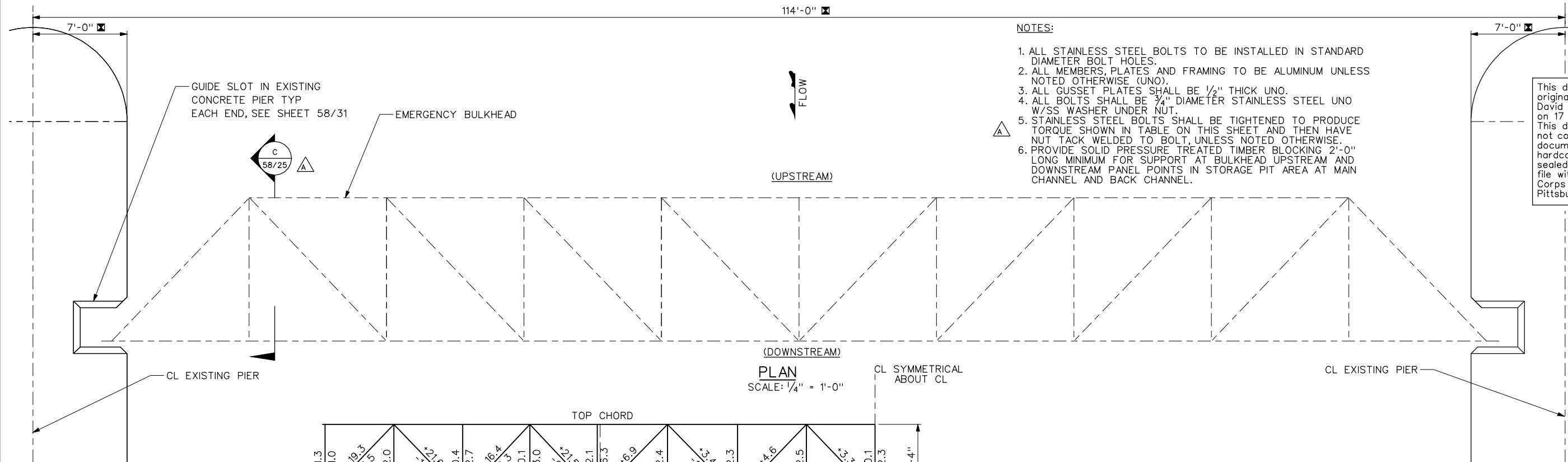
Submitted by:	/s/ PAULA G. BOREN, P.E.	
Design by:	DAM	SECTION CHIEF
Date:	17-JUN-05	IFB NO:
Drawn by:	JAK	Revision Date:
Checked by:	DAM	Pen:
Plotted by:	JAK	Date:
Plot Scale:	1:66667:1,000000	Color Table:
Pen Table:	17-JUN-05	Color:
Color:	RGB	Table:
A GENERAL NOTES REVISED		
Emsworth Dams Bulkheads\General\OLEM_G-42d.S01		

OHIO RIVER	EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS	HYDROGRAPHS & DISCHARGES
DISCHARGE DURATION AND	STAGE DISCHARGE RELATIONSHIPS



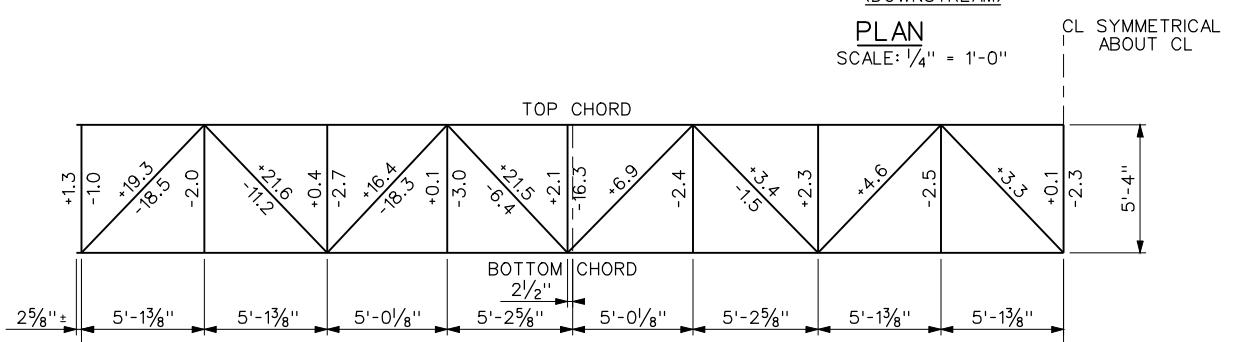
US Army Corps
of Engineers
Pittsburgh District

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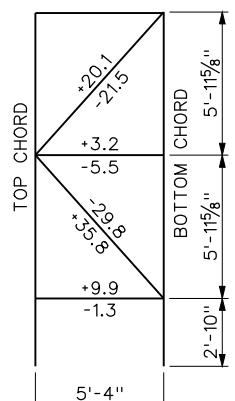


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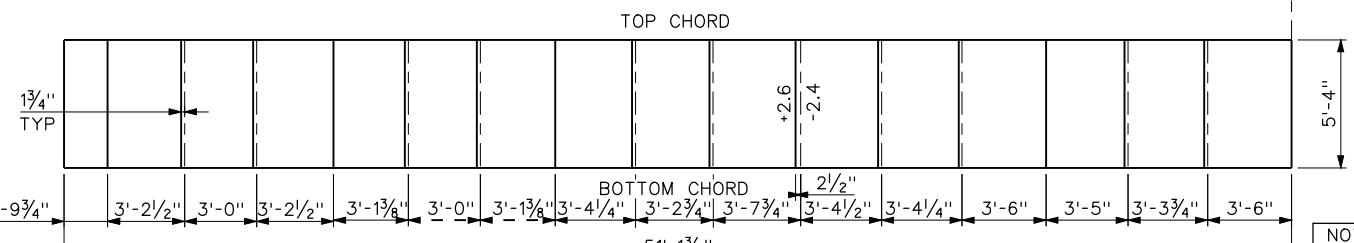
1. ALL STAINLESS STEEL BOLTS TO BE INSTALLED IN STANDARD DIAMETER BOLT HOLES.
 2. ALL MEMBERS, PLATES AND FRAMING TO BE ALUMINUM UNLESS NOTED OTHERWISE (UNO).
 3. ALL GUSSET PLATES SHALL BE $\frac{1}{2}$ " THICK UNO.
 4. ALL BOLTS SHALL BE $\frac{3}{4}$ " DIAMETER STAINLESS STEEL UNO W/SS WASHER UNDER NUT.
 5. STAINLESS STEEL BOLTS SHALL BE TIGHTENED TO PRODUCE TORQUE SHOWN IN TABLE ON THIS SHEET AND THEN HAVE NUT TACK WELDED TO BOLT, UNLESS NOTED OTHERWISE.
 6. PROVIDE SOLID PRESSURE TREATED TIMBER BLOCKING 2'-0" LONG MINIMUM FOR SUPPORT AT BULKHEAD UPSTREAM AND DOWNSTREAM PANEL POINTS IN STORAGE PIT AREA AT MAIN CHANNEL AND BACK CHANNEL.



PLAN CL SYMMETRICAL
SCALE: $\frac{1}{4}$ " = 1'-0" | ABOUT CL

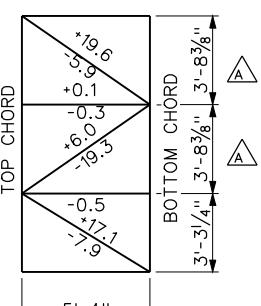


SECTION A-A
SCALE: $\frac{1}{4}$ " = 1'-0" 58/25



51'-1 1/4"

MEMBER FORCES - ENVELOPE



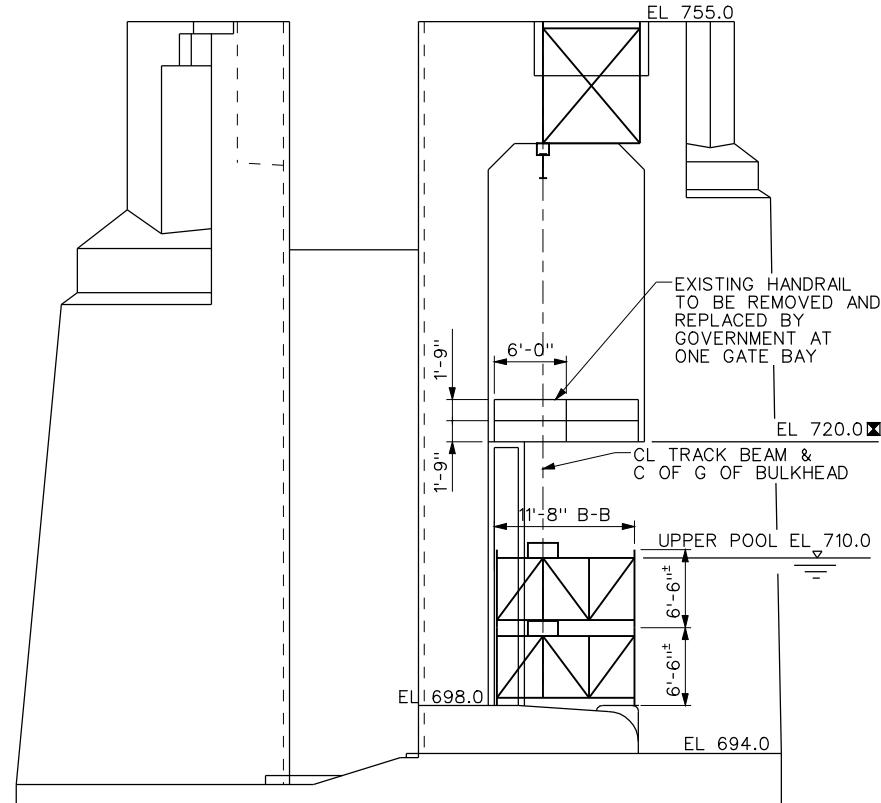
SECTION
SCALE: $\frac{1}{4}$ " = 1'-0" 58/25 B A

NOTES:
1. TENSION = -
2. COMPRESSION = +
3. ALL FORCES IN KIPS

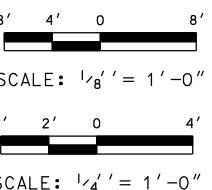
- NOTES:

 - FOUR (4) BULKHEADS TO BE PROVIDED.
 - TWO (2), TO BE INSTALLED AND REMAIN AT THE MAIN CHANNEL.
 - TWO (2), TO BE INSTALLED AT THE MAIN CHANNEL AND AFTER ACCEPTANCE BY THE GOVERNMENT SHALL BE DELIVERED VIA BARGE TO THE PITTSBURGH ENGINEERING WAREHOUSE AND REPAIR STATION (PFWARS).

BOLT DIA.	TORQUE
1/2"	350 in-lbf
5/8"	800 in-lbf
3/4"	1200 in-lbf
7/8"	1900 in-lbf
1"	2800 in-lbf UNLESS OTHERWISE NOTED



SECTION C A
SCALE: 1/4 IN. = 1 FT. 0 IN. 50' (25')



**OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
GENERAL PLAN AND
MEMBER FORCES**

DLZ		Submitted by: <i>/s/ David A. Brittain</i> SECTION CHEF
Design by: CVP	Drawn by: JAH	Check by: CDS
6721 Heather Road, Columbus, Ohio 43229 Bayer CropScience Attn: D. A. Brittain Phone: 614-876-5000 Fax: 614-876-5000 Email: David.Brittain@bayercropscience.com	Submission Date: 17 JUNE 05	FB NO.: W91WN-05-B-0002
		Sheet 12 of 30

M-58/25.1



US Army Corps
of Engineers
Pittsburgh District

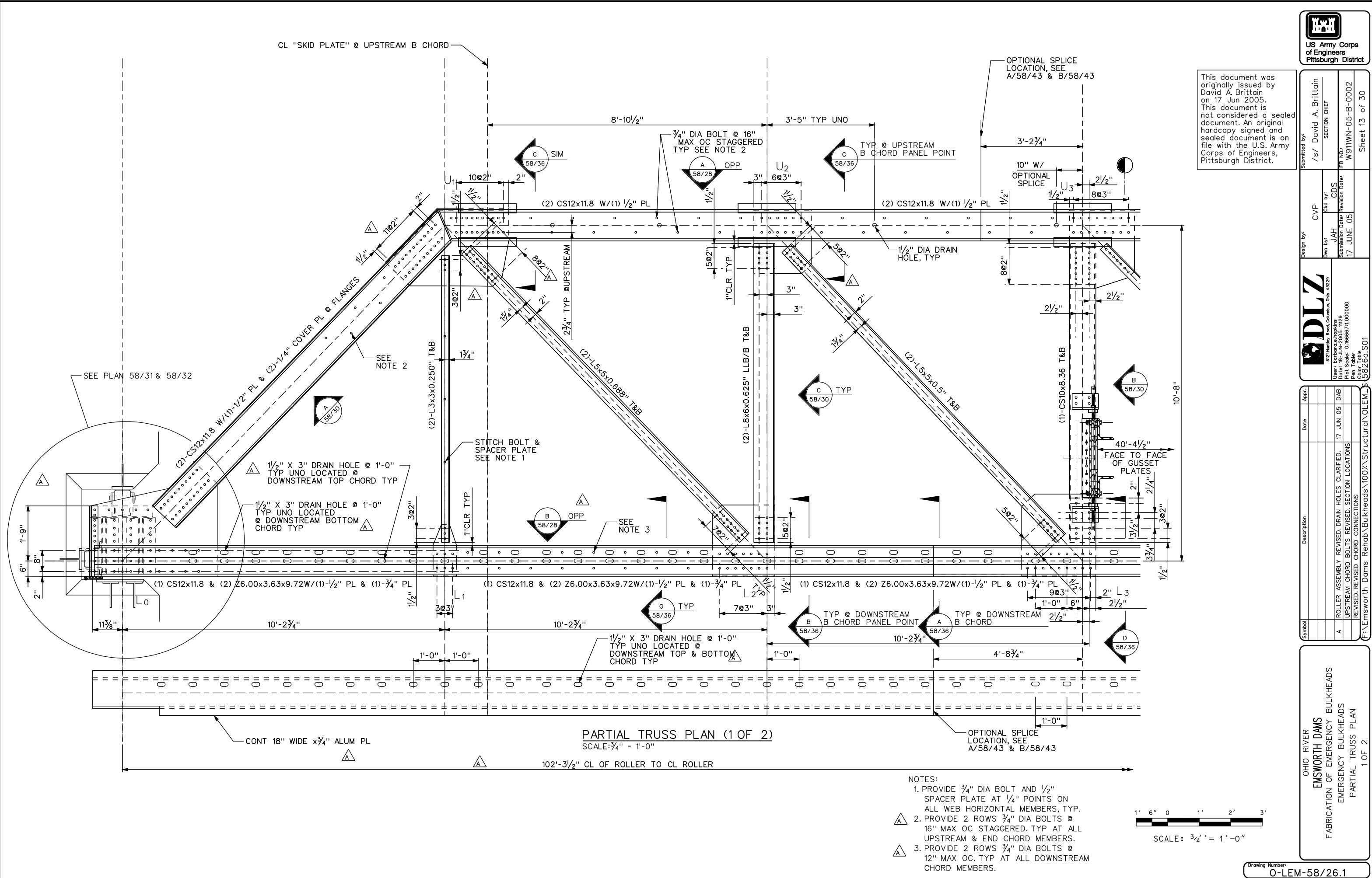
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Submitted by: s/ David A. Brittain
Section Chief

IFB No.: W911WN-05-B-0002

Revision Date: 17 JUNE 05

Sheet 13 of 30





US Army Corps
of Engineers
Pittsburgh District

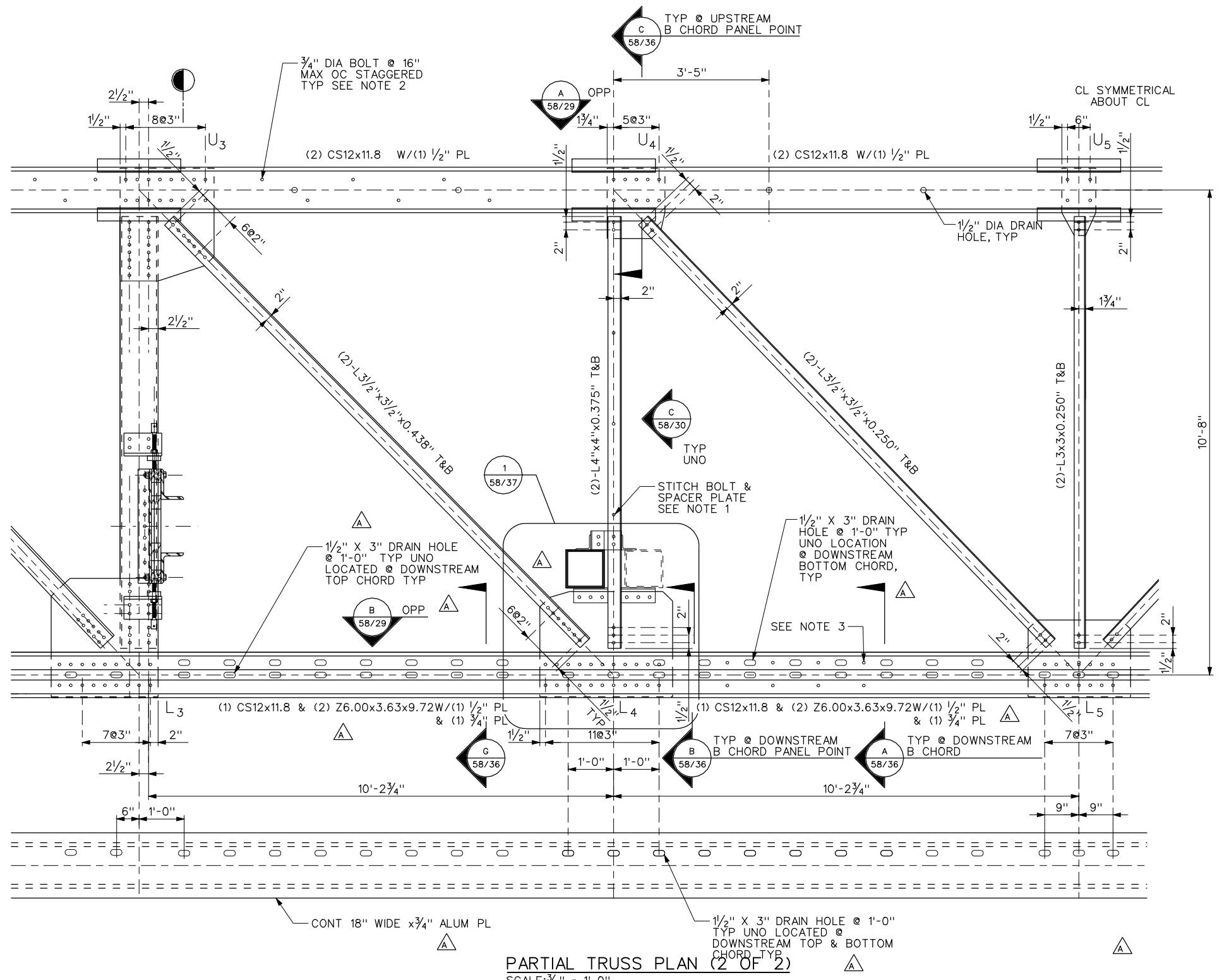
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Submitted by:	s/ David A. Brittain
Section:	CHEF
IFB No.:	W911WN-05-B-0002
Submission Date:	17 JUNE 05
Revision Date:	

Design by:	DAB
Drawn by:	JAH
Checked by:	CDS
Date:	17 JUNE 05

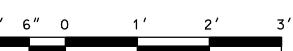
Symbol	Description
A	GUIDE BEAM CONN. REVISED. DRAIN HOLES CLARIFIED. UPSTREAM CHORD BOLTS REVISED. UPSTREAM CHORD PLATES REVISED.
G	CONT 18" WIDE x 3/4" ALUM PL

OHIO RIVER	EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS	EMERGENCY BULKHEADS
PARTIAL TRUSS PLAN	2 OF 2



NOTES:

1. PROVIDE $\frac{3}{4}$ " DIA BOLT AND $\frac{1}{2}$ " SPACER PLATE AT $\frac{1}{4}$ " POINTS ON ALL WEB HORIZONTAL MEMBERS, TYP.
2. PROVIDE 2 ROWS $\frac{3}{4}$ " DIA BOLTS @ 16" MAX OC STAGGERED. TYP AT ALL UPSTREAM & END CHORD MEMBERS.
3. PROVIDE 2 ROWS $\frac{3}{4}$ " DIA BOLTS @ 12" MAX OC. TYP AT ALL DOWNSTREAM CHORD MEMBERS.



SCALE: $\frac{3}{4}'' = 1'-0''$

Drawing Number:
O-LEM-58/27.1

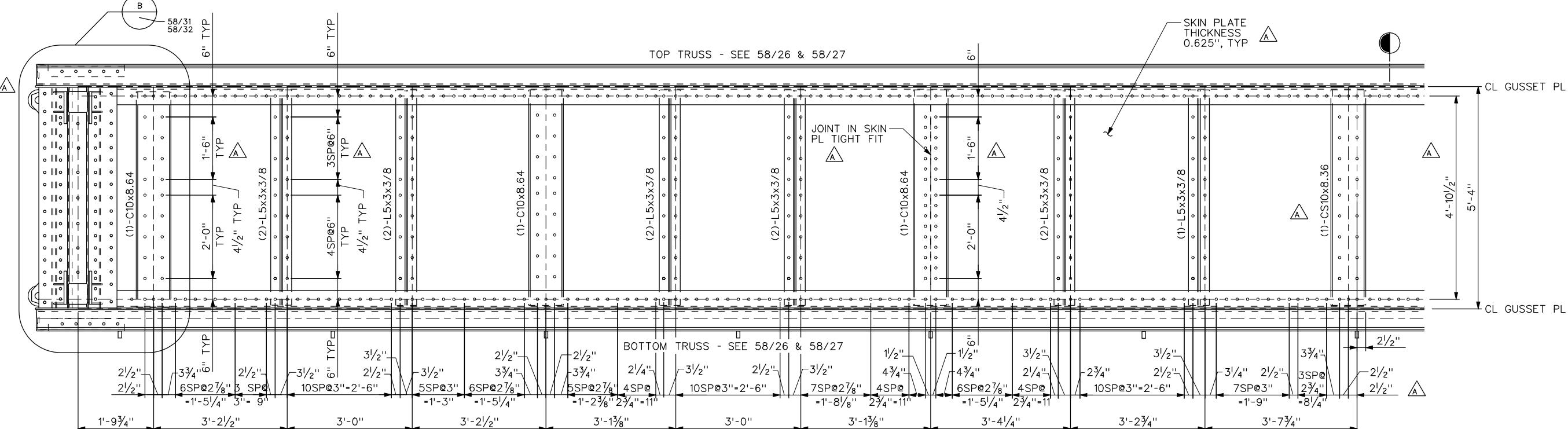
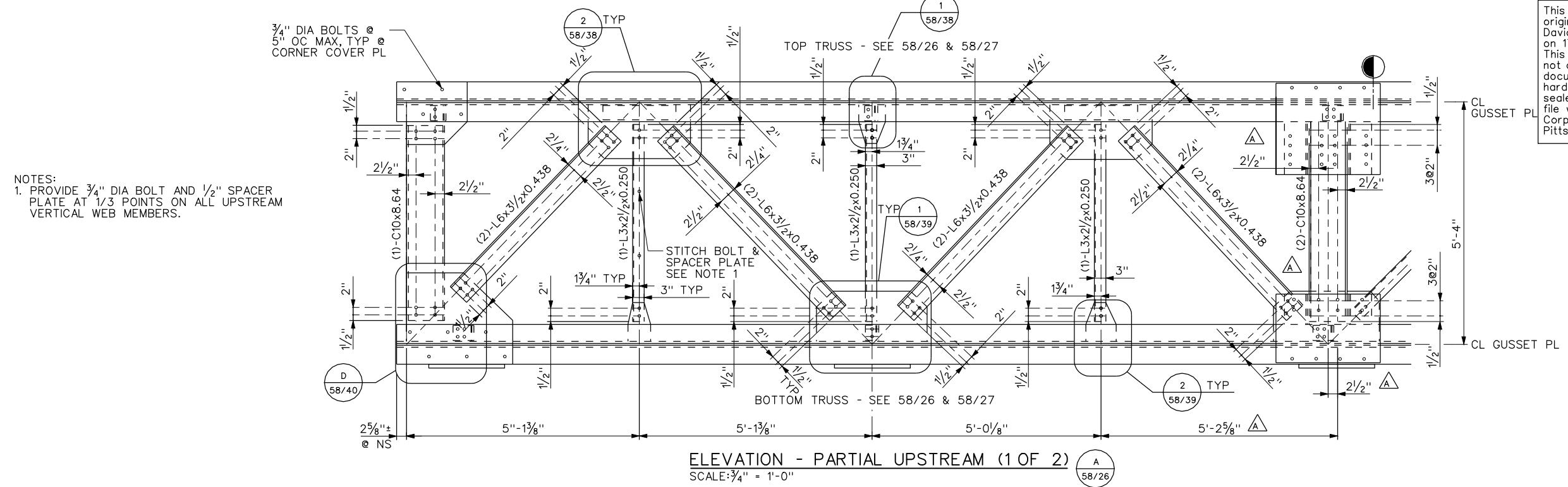


US Army Corps
of Engineers
Pittsburgh District

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Submitted by: s/ David A. Brittain
Section Chief

IFB No.: W911WN-05-B-0002
Revision Date: 17 JUNE 05
Sheet 15 of 30



1' 6" 0 1' 2' 3'
SCALE: $\frac{3}{4}$ " = 1'-0"

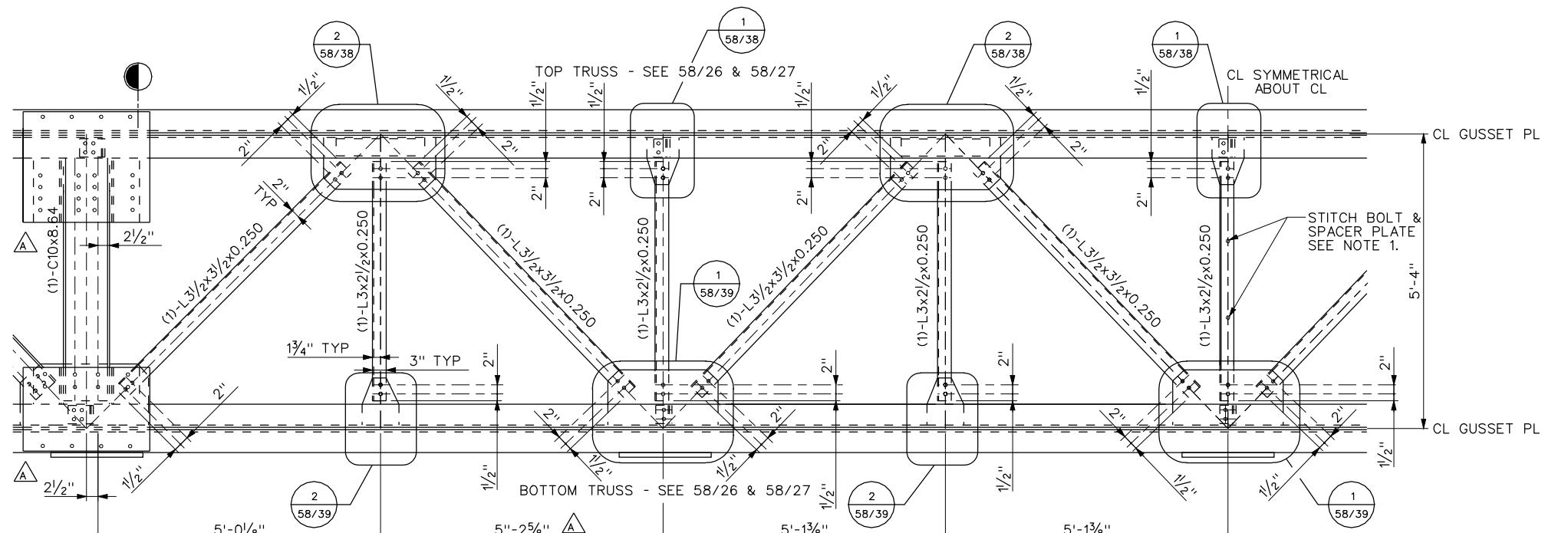
Symbol	Description	Date	Appr.
A	ROLLER ASSEMBLY DETAILS & SKIN PLATE THICKNESS REVISED, CHANNEL SIZE CHANGED, SKIN PLATE JOINTS & BOLTS INDICATED GUSSET PLATES DETAILS REVISED.	17 JUN 05	DAB

OHIO RIVER
EMSWORTH DAMS
EMERGENCY BULKHEADS
FABRICATION OF EMERGENCY BULKHEADS
ELEVATIONS - PARTIAL DOWNSTREAM &
UPSTREAM 1 OF 2
Drawing Number: O-LEM-58/28.1



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Engineers
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ELEVATION - PARTIAL UPSTREAM (2 OF 2) A
SCALE: $\frac{3}{4}$ " = 1'-0" 58/27

SCALE: $\frac{3}{4}$ " = 1'-0"

TOP TRUSS - SEE 58/26 & 58/27

SKIN PLATE THICKNESS 0.625", TYP

CL SYMMETRICAL ABOUT CL

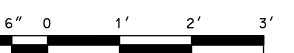
CL GUSSET PL

CL GUSSET PL

BOTTOM TRUSS - SEE 58/26 & 58/27

SCALE: $\frac{3}{4}$ " = 1'-0"

NOTE
1. WEB MEMBERS NOT SHOWN FOR CLARITY



SCALE: $\frac{3}{4}'' = 1'-0''$

UDLZ		<i>6121 Huntington Road, Columbus, Ohio 43229</i>	<i>s /s/ Davia A. Brittain</i>
		<i>User: barbara.s.hopkins</i>	<i>SECTION CHIEF</i>
		<i>Date: 18-JUN-2005</i>	<i>FBI NO:</i>
		<i>Revision Date: 17 JUNE 05</i>	<i>W911WN-05-B-0002</i>
<i>CCG/BS/904/S01</i>			
Sheet 16 of 30			

Skin Plate Thickness Revised, Added Skin Plate 17 Jun 05 DAB
Bolts, Gusset Plates-Details Revised.
C:\Users\Emsworth.Damns.Retrob\Bulkheads\100%\\Structural\OLE_M

EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEAD
ELEVATIONS - PARTIAL DOWNSTREAM &
UPSTREAM 2 OF 2



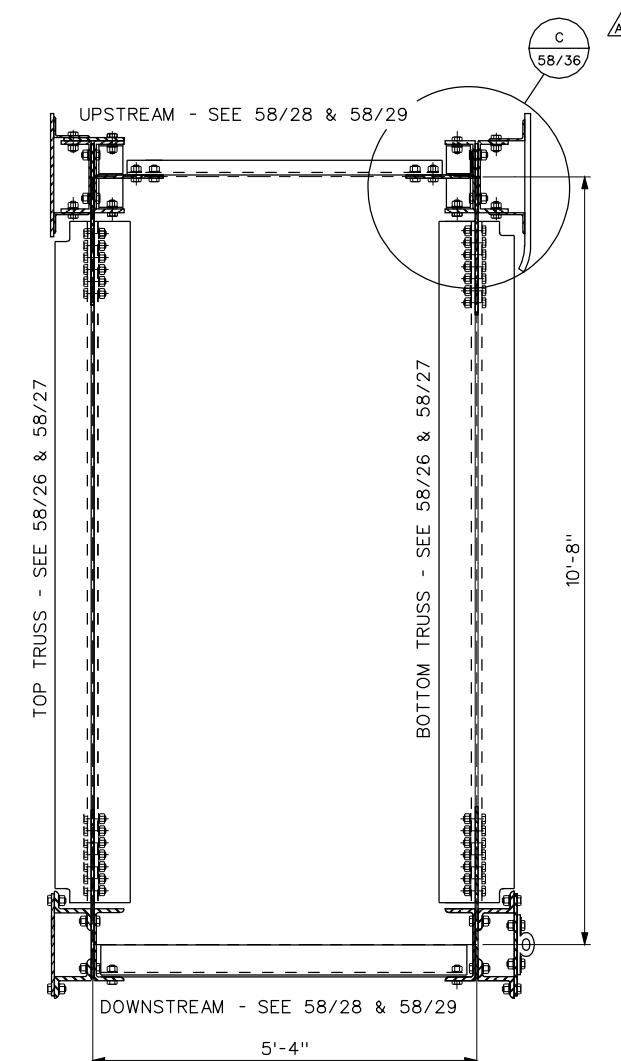
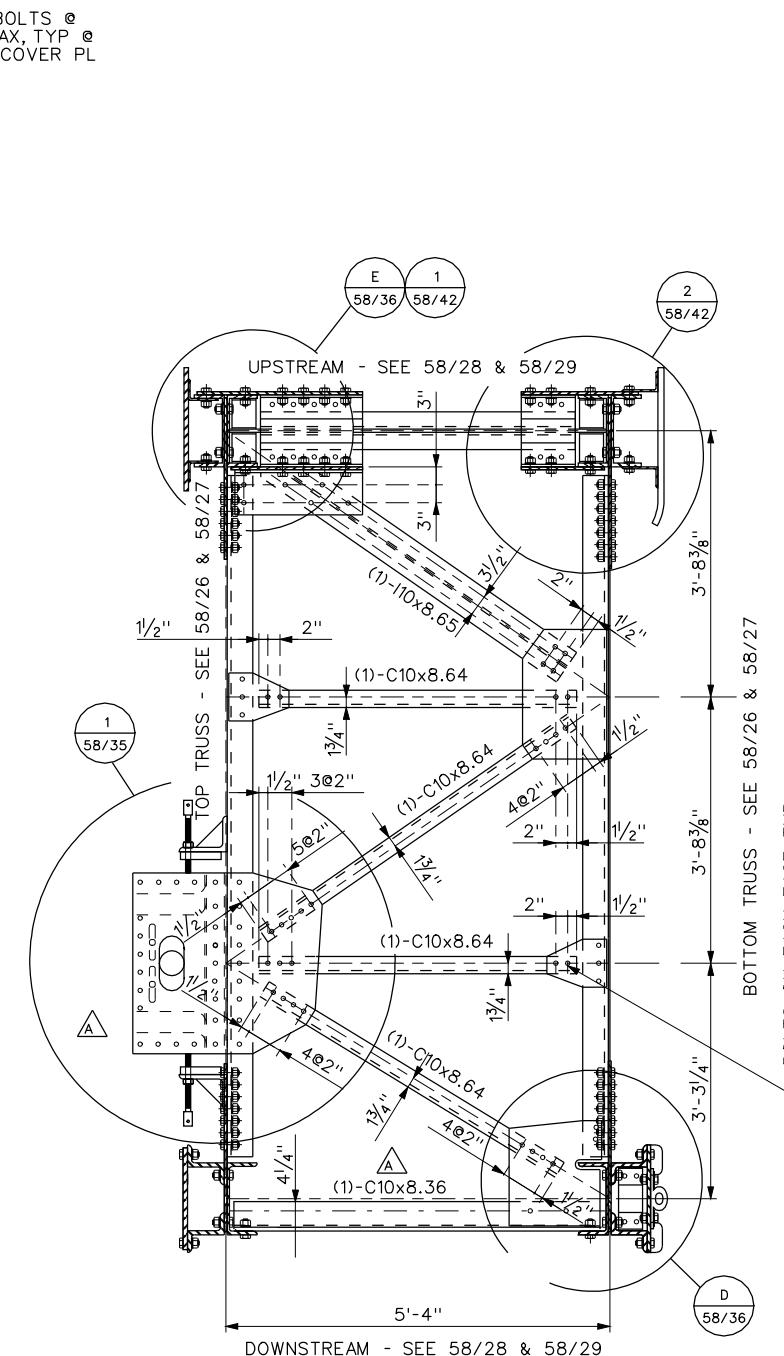
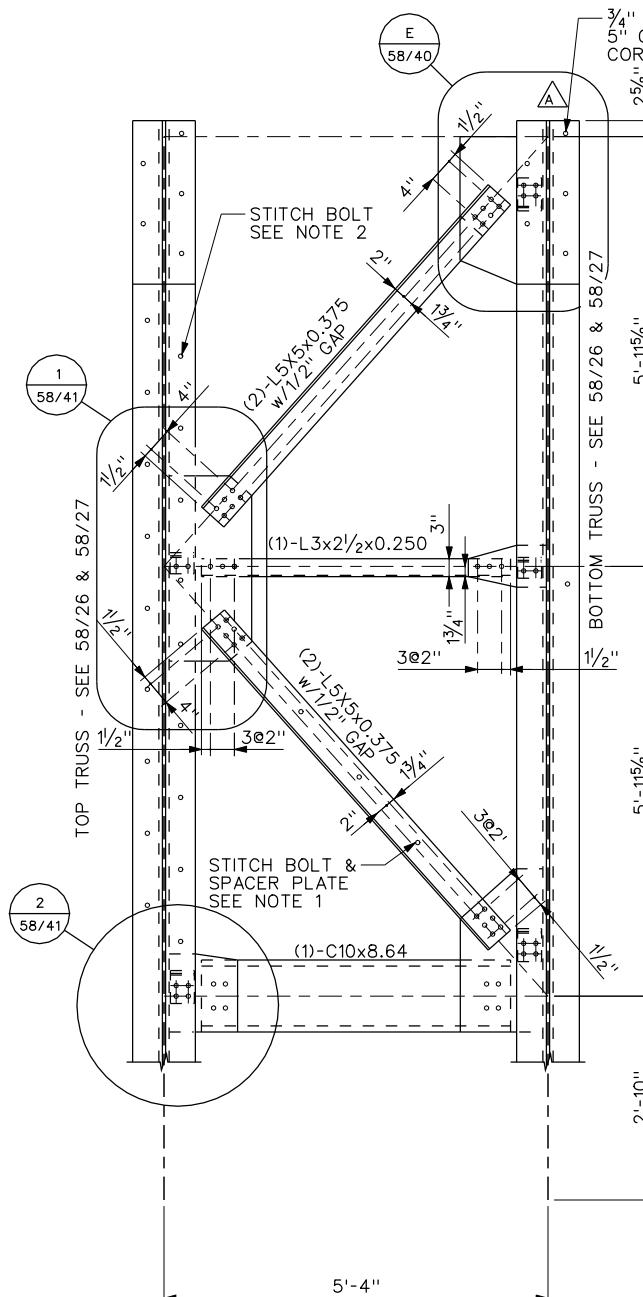
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Submitted by:
s/ David A. Brittain
SECTION CHIEF

IFB No.: W911WN-05-B-0002

Sheet 17 of 30



- NOTES:**
1. PROVIDE $\frac{3}{4}$ " DIA BOLT AND $\frac{1}{2}$ " SPACER PLATE AT $\frac{1}{4}$ " POINTS ON ALL END PANEL WEB MEMBERS.
 2. PROVIDE $\frac{3}{4}$ " DIA BOLTS @ $6'' \pm$ OC TO FASTEN COVER PLATE TO CS12 AT ALL END PANEL CHORD MEMBERS.

1' 6" 0 1' 2' 3'
SCALE: $\frac{3}{4}$ " = 1'-0"

Drawing Number:
O-LEM-58/30.1

OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
EMSWORTH DAMS REHAB &
INTERMEDIATE PANELS



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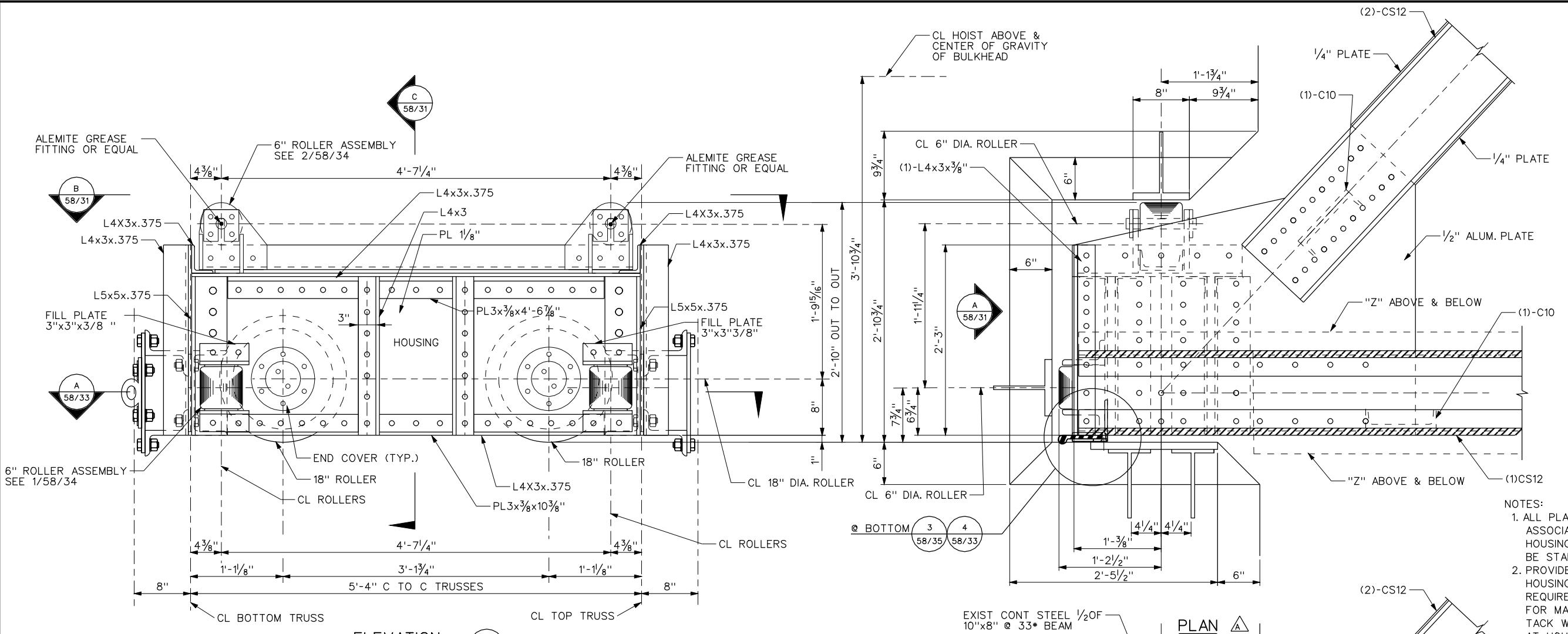
Submitted by:		/s/ David A. Brittain	
SECTION CHIEF			
Design by:	CVP	Drawn by:	JAK
		Ckd by:	CDS
Submission Date:	17 JUNE 05	IB#:	W91WVN-05-B-0002
Revision Date:			
		Sheet 18 of 30	

Appr. _____
Date _____
17 JUN 05 DAB
structural\OLEM_S

Symbol	Description
A	REVISED CONNECTIONS FOR CHORDS. REVISED HOUSING & ROLLERS ASSEMBLY.
	\EnviroWorth Dams Rehab Bulkheads\100\>S

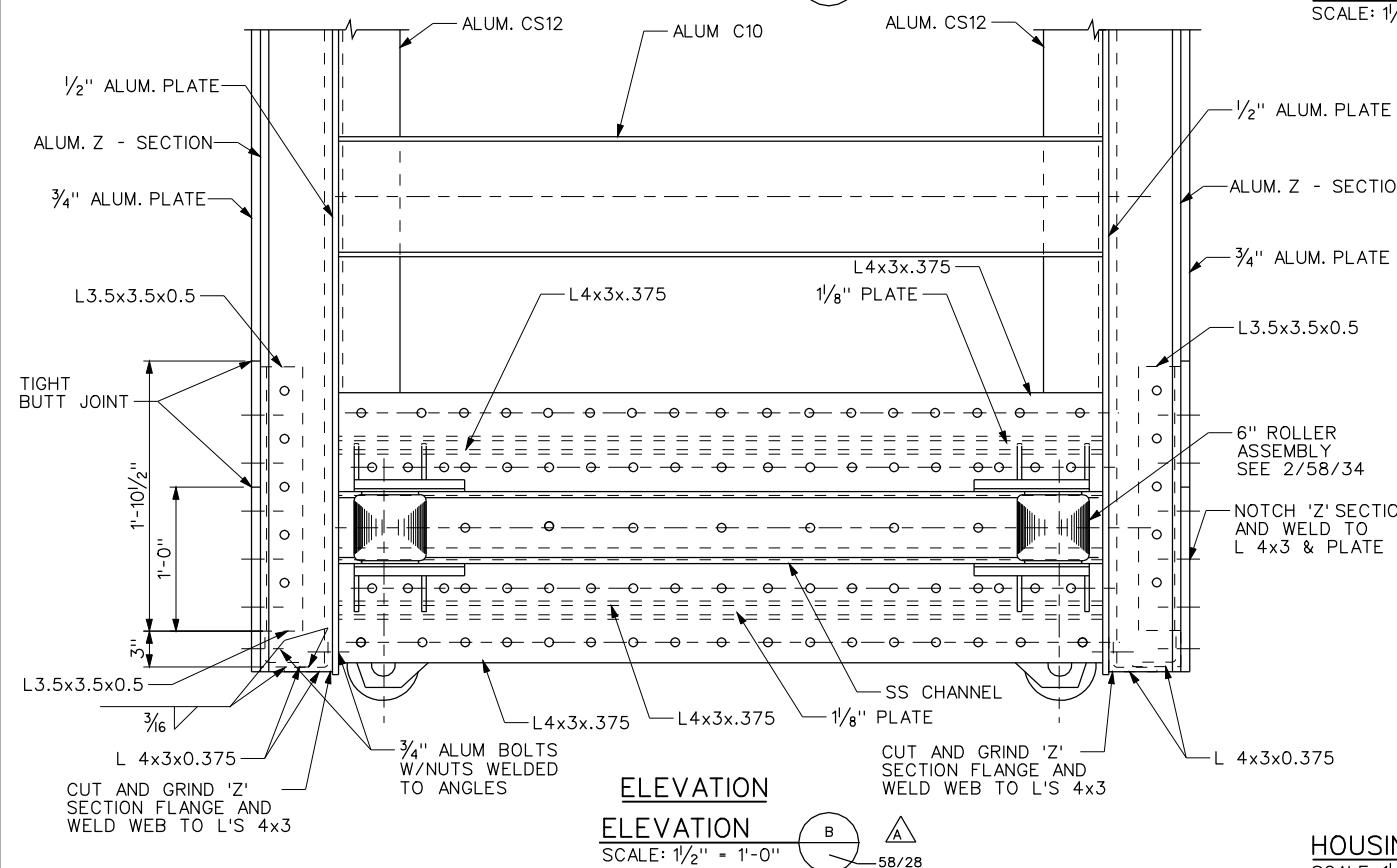
**OHIO RIVER
EMSWORTH DAMS
APPLICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
PLAN & ELEVATIONS
HOUSING & ROLLERS ASSEMBLY**

-58 / 311



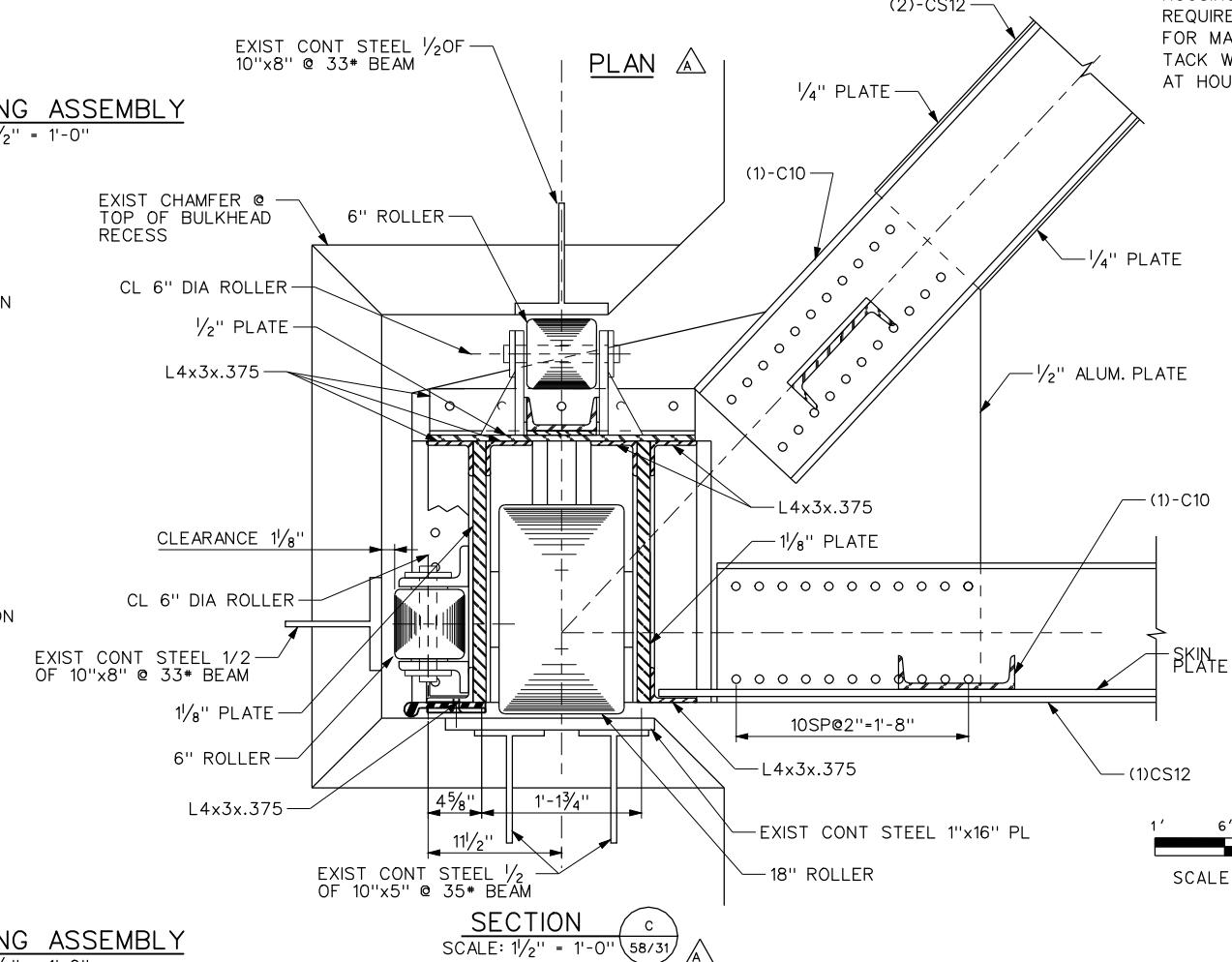
ELEVATION A
SCALE: 1/4" - 1'-0" 58/31

ELEVATION A
SCALE: 1/4" - 1'-0" 58/31



ELEVATION
ELEVATION
SCALE: $1\frac{1}{2}'' = 1'-0''$

HOUSING ASSEMBLY





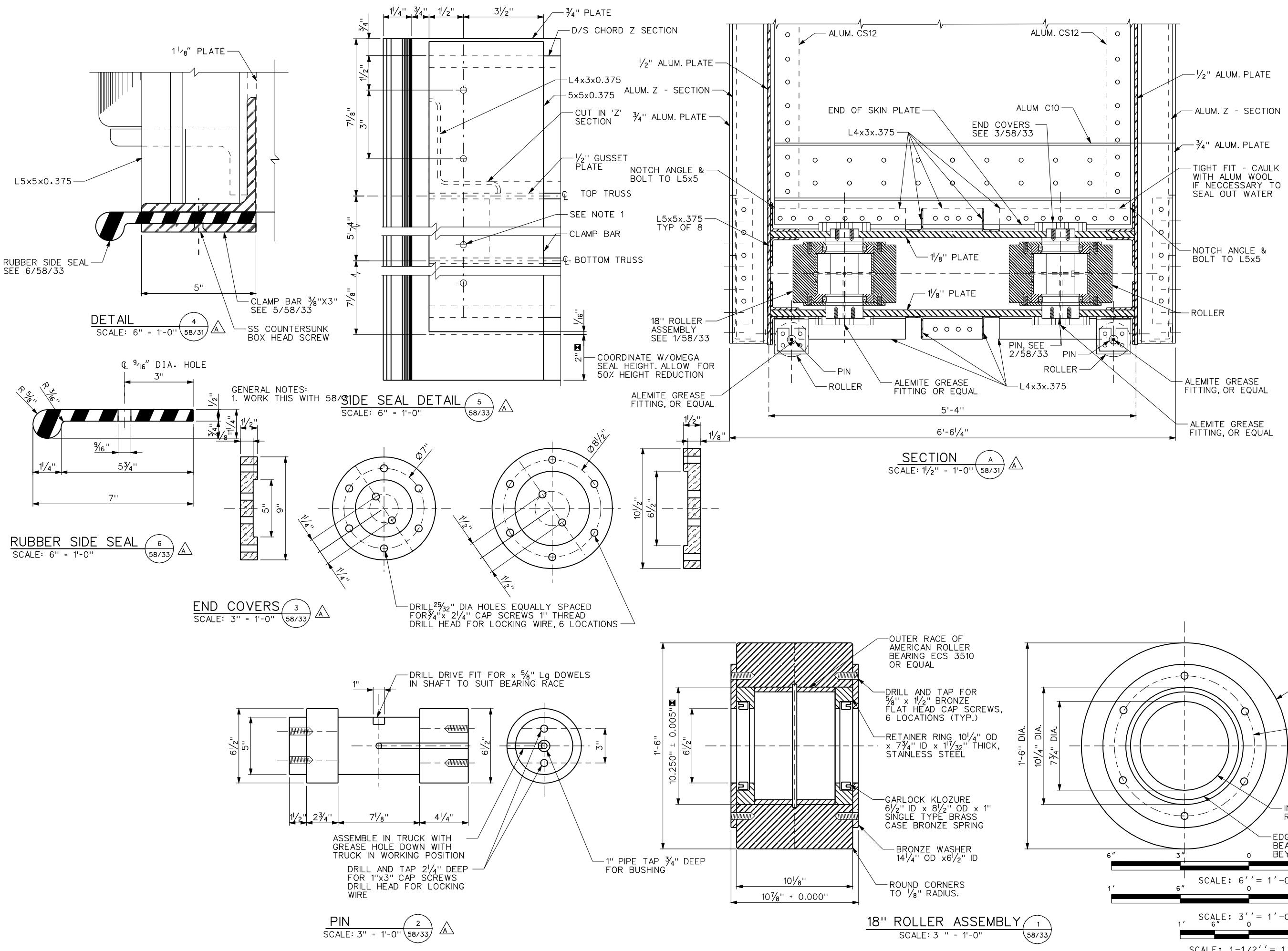
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Submitted by:
s/ David A. Brittain
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IFB No.: W911WN-05-B-0002

Sheet 20 of 30



EDLZ
6121 Hanley Road, Columbus, Ohio 43228
User: borbara.hopkins
Date: 18-JUN-2005 11:29
Plot Scale: 0.06667:1.000000
Pen Table: Color Table
Color Table: S833d.S01

Symbol	Description
A	REVISED ROLLERS, PINS, SEALS & HOUSING ASSEMBLY. 117 JUN 05 DAB : Emsworth Dams Rehbd\Bulkheads\Structural\OLEM_S

OHIO RIVER EMSWORTH DAMS FABRICATION OF EMERGENCY BULKHEADS EMERGENCY BULKHEADS SECTIONS & DETAILS HOUSING & ROLLERS ASSEMBLY 1 of 2



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Pittsburgh District

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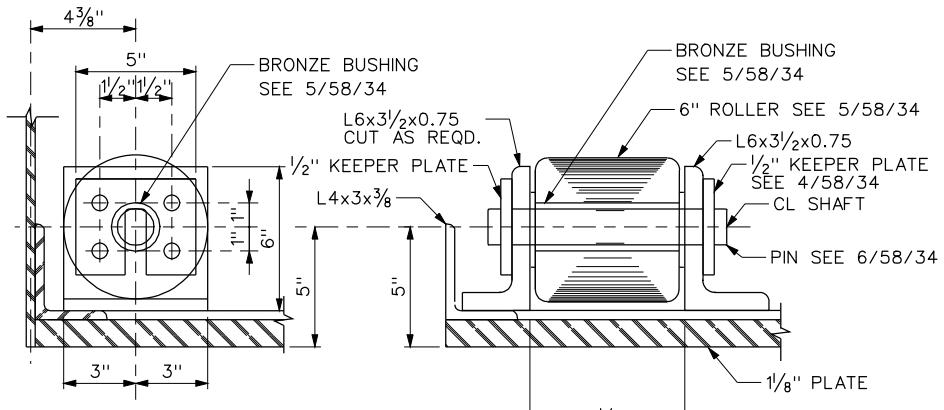
Submitted by:
/s/ David A. Brittain
SECTION CHIEF
CDS
IFB No.: W911WN-05-B-0002
Sheet 21 of 30



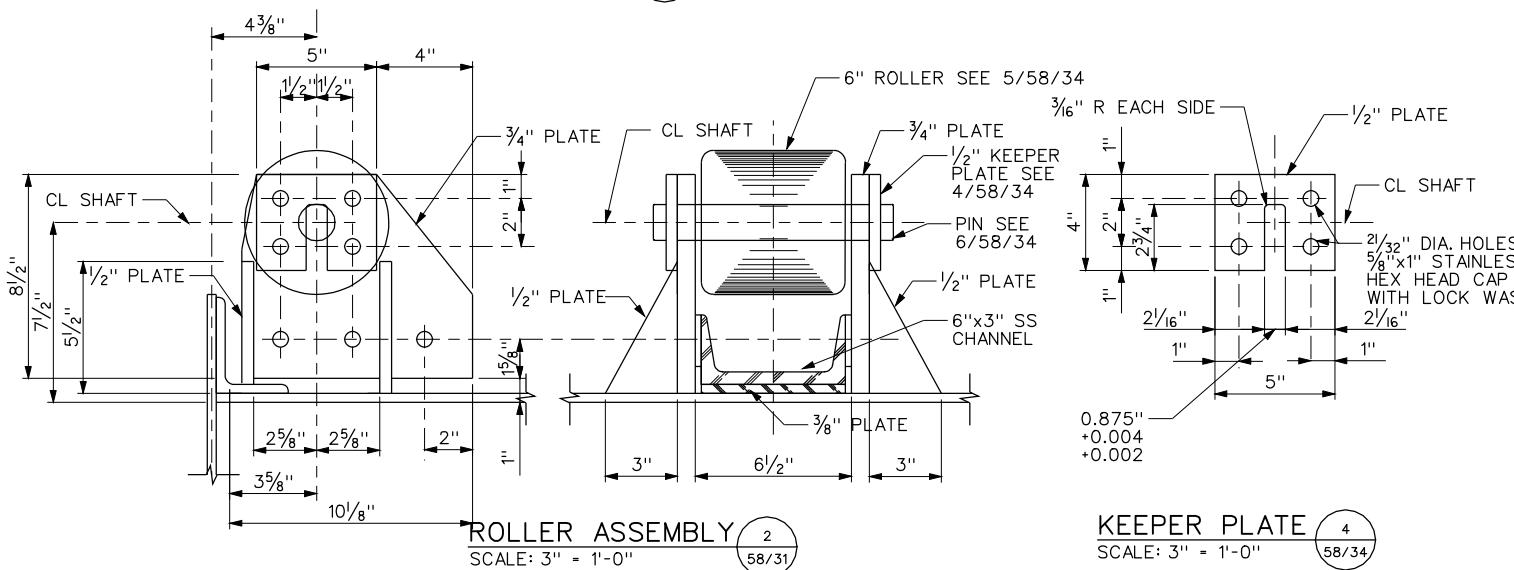
User: barbara.hopkins
Date: 18-JUN-2005 11:29
Plot Scale: 0.066671:1000000
Pen Table: Color
Table: S83-d.S01

Symbol	Description	Date	Appr.
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SECTION A-A	ROLLER	17 JUN 05	

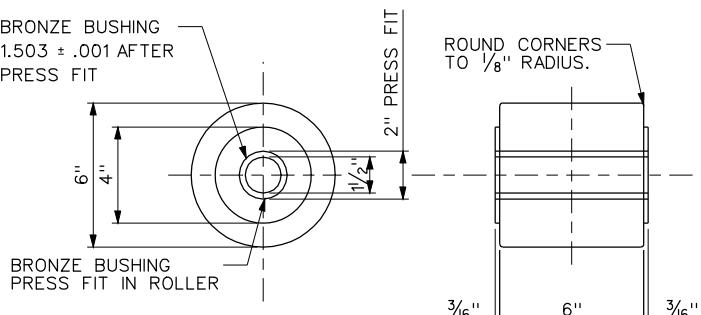
OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
SECTIONS & DETAILS
HOUSING & ROLLERS ASSEMBLY 2 OF 2
Drawing Number: O-LEM-58/34.1



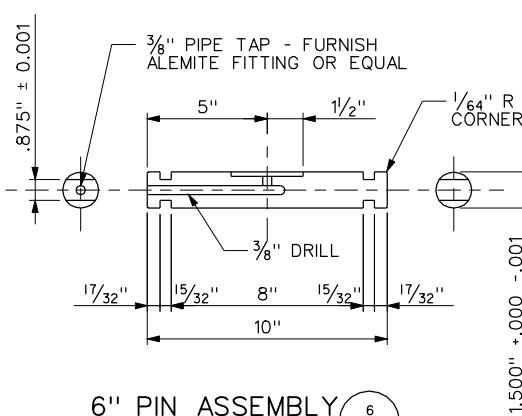
ROLLER ASSEMBLY
SCALE: 3" = 1'-0"
58/31



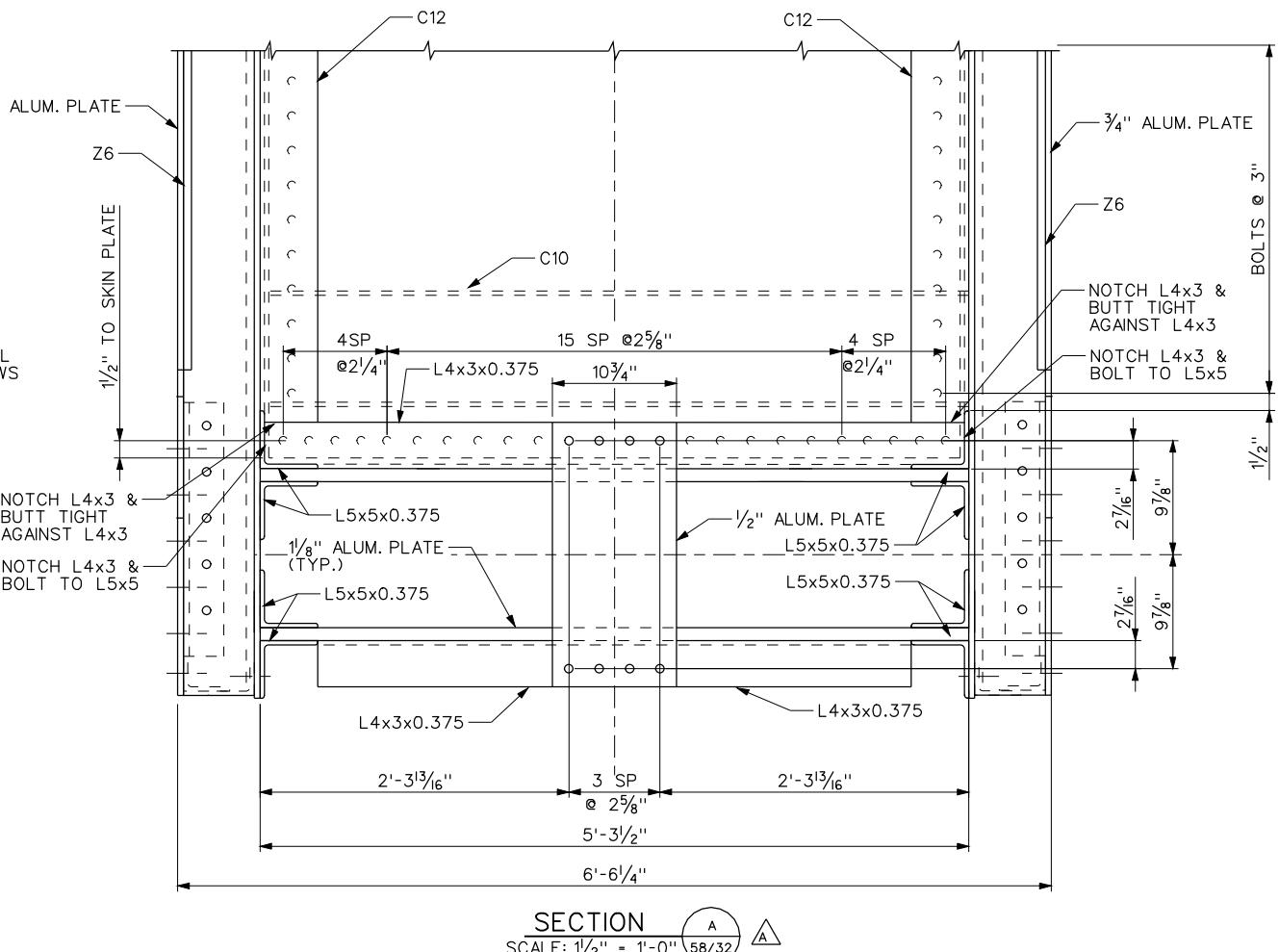
KEEPER PLATE
SCALE: 3" = 1'-0"
58/34



6" ROLLER
SCALE: 3" = 1'-0"
58/34



6" PIN ASSEMBLY
SCALE: 3" = 1'-0"
58/34



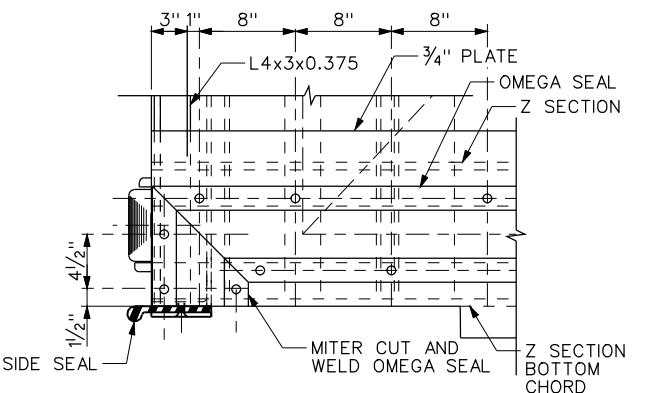
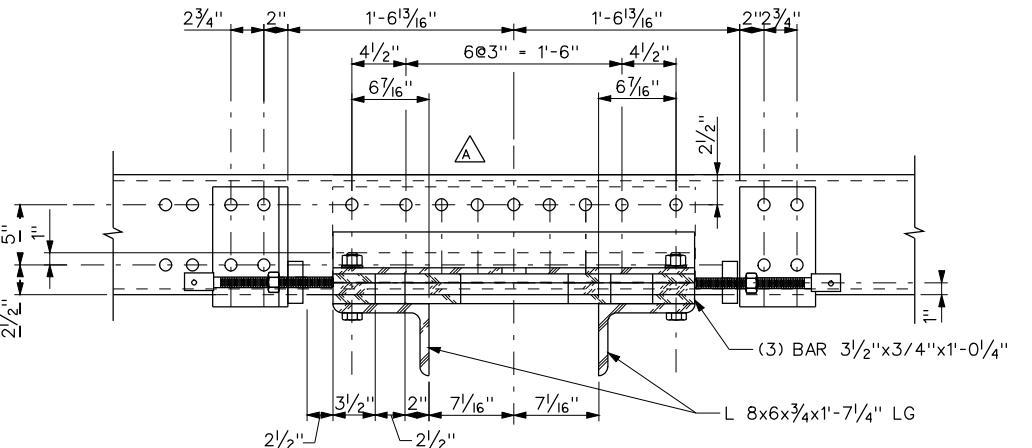


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Pittsburgh District

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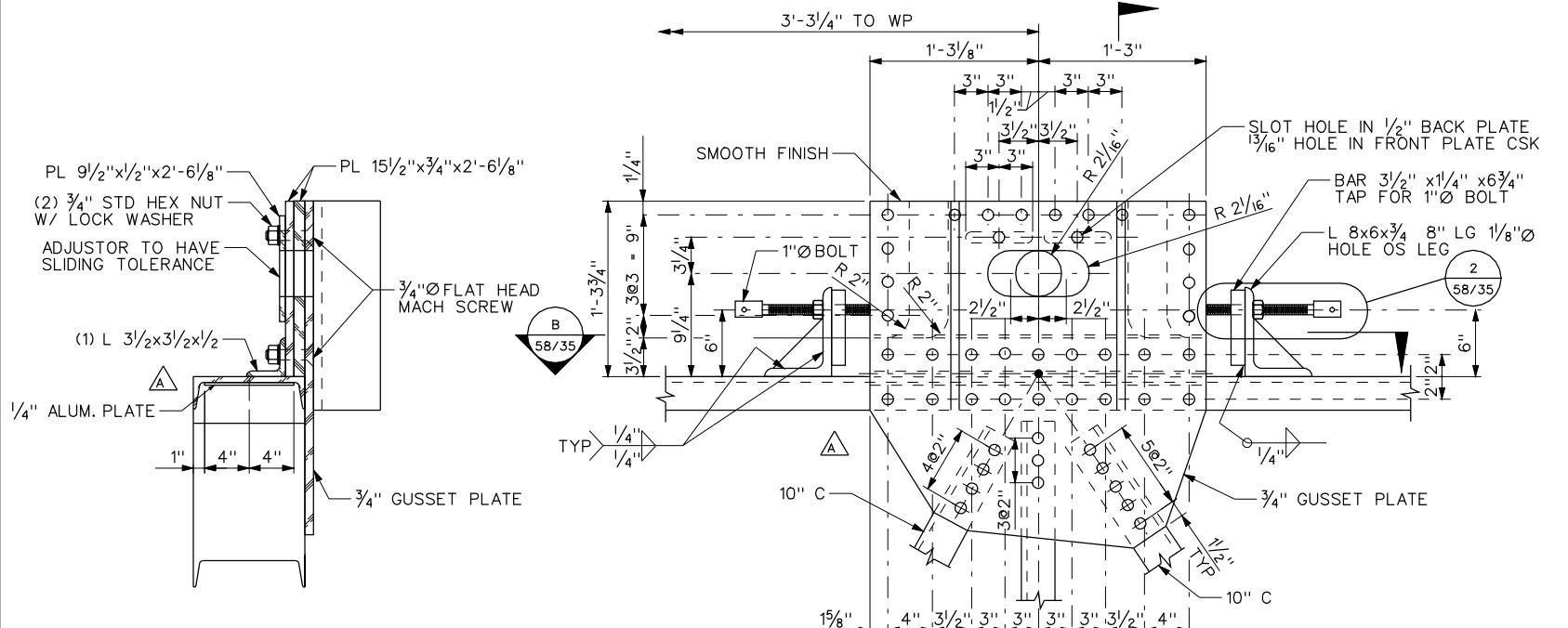
/S/ DAVID A. BRIGGS
SECTION CHIEF
FB NO:
W911WN-05-B-0002
Sheet 22 of 30

NOTE:
ALL ELEMENTS ASSOCIATED W/LIFT
ASSEMBLY TO BE STAINLESS STEEL
W/3/4" DIA STAINLESS STEEL BOLTS
& NUTS UNO.

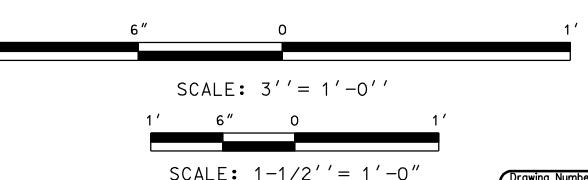
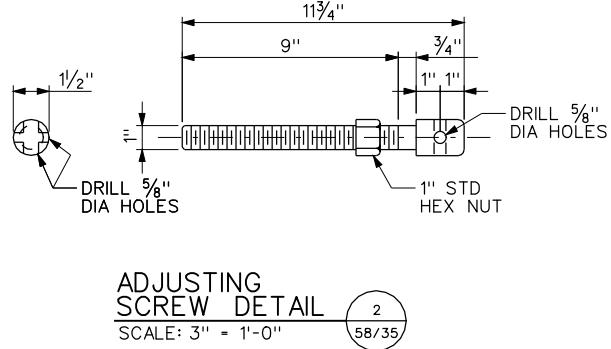


SECTION B
SCALE: $1\frac{1}{2}'' = 1'-0''$ 58/35

DETAIL
E: $1\frac{1}{2}''$ = 1'-0" 58/31 A



SECTION A
SCALE: $1\frac{1}{2}'' = 1'-0''$ 58/35



OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
SECTION & DETAILS
LIFTING ASSEMBLY

DLZ	CVP	/s/ David A. Britain	
		SECTION CHIEF	
6121 Hanley Road, Columbus, Ohio 43229 barbara.hopkins@odot.state.oh.us Date: 18-JUN-2005 11:29 Plot Scale: 1:666671/1000000 Plot Table: S05050501	Down by: JAH Submission Date: 17 JUNE 05	Ckd by: CDS Revision Date:	
		IB NO: W911WN-05-B-0002	Sheet 22 of 30

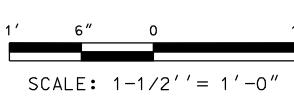
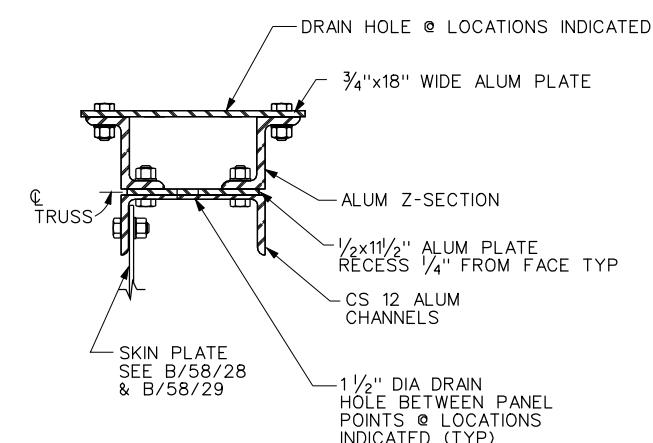
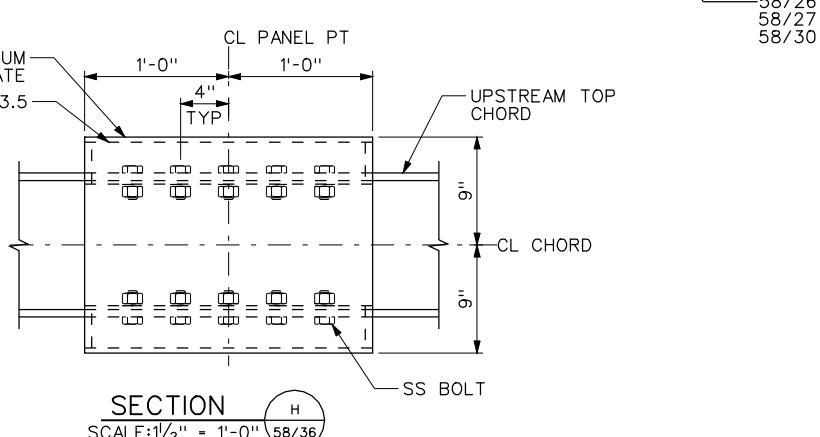
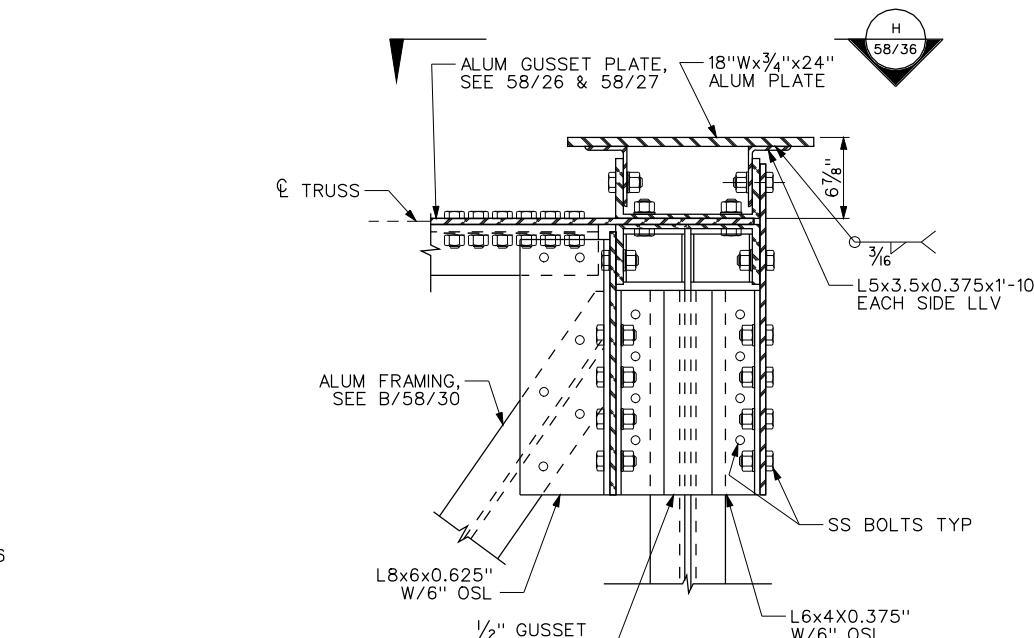
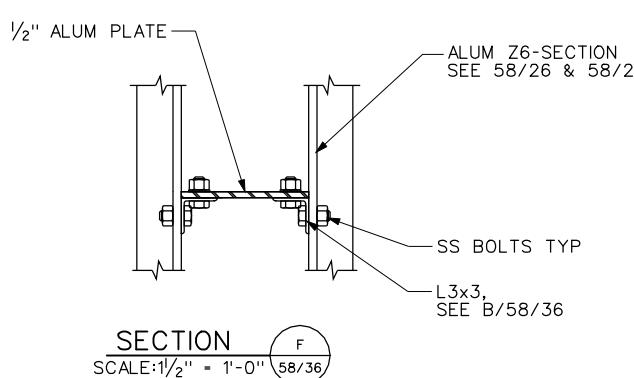
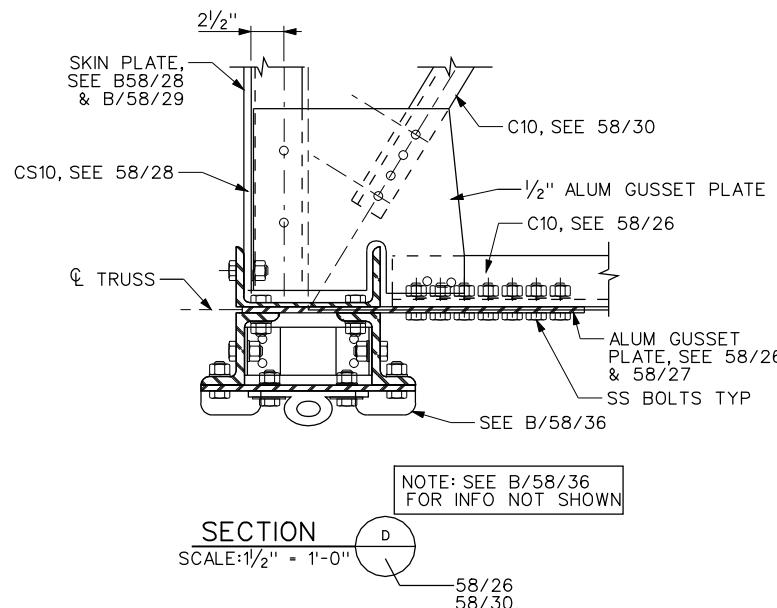
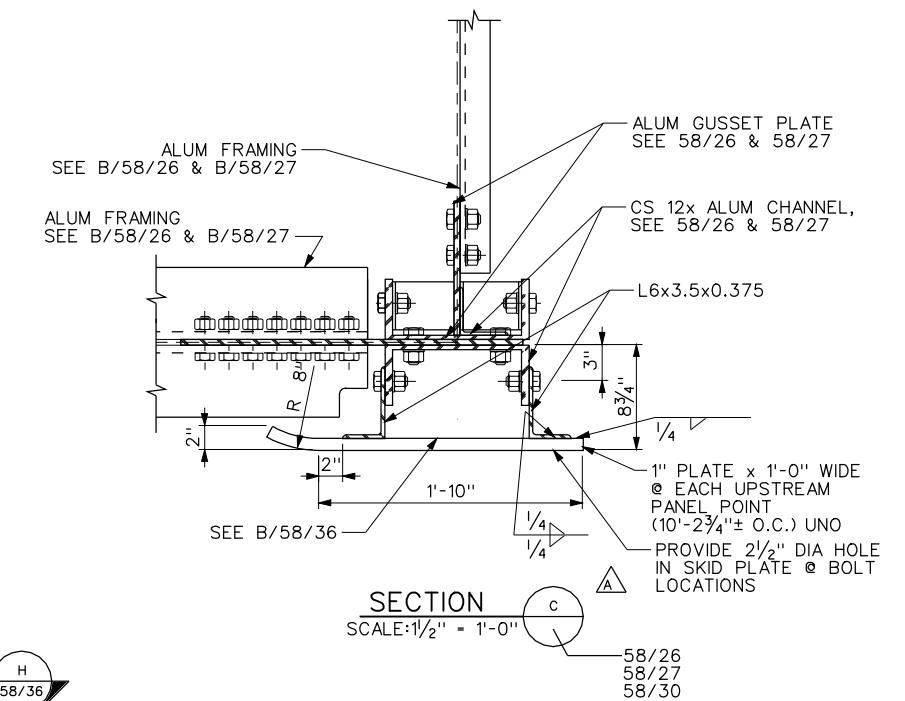
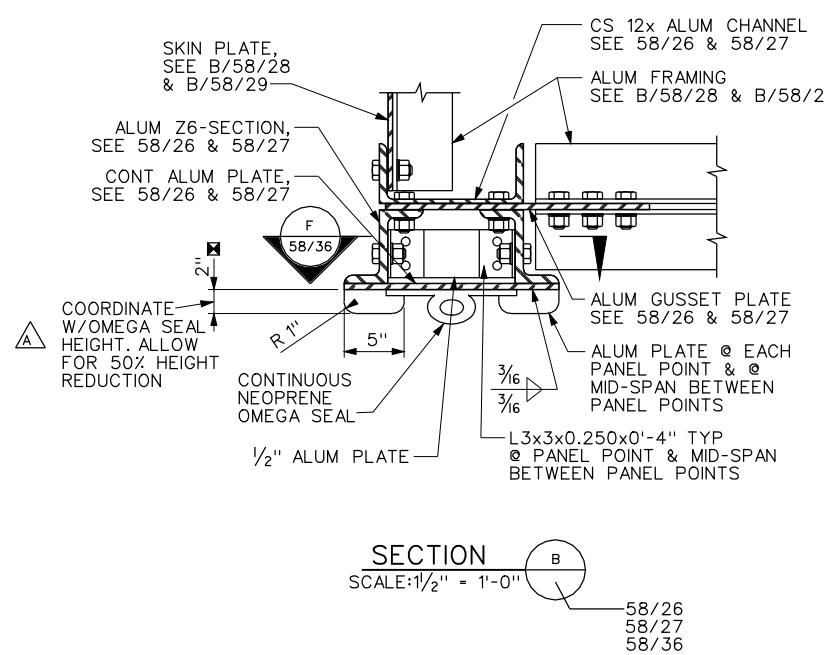
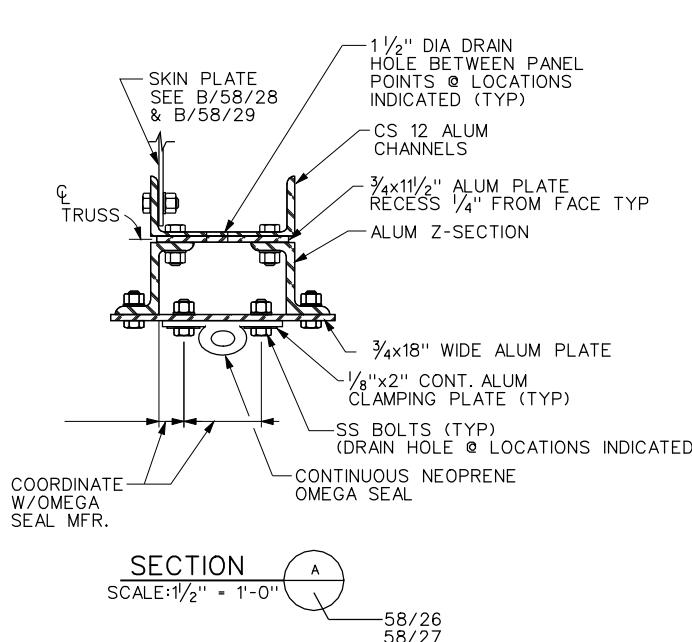
Symbol	Description	Date	App.
A	REVISED LIFTING ASSEMBLY. ADDED SEAL DETAIL. DETAIL 1-WORK POINT REVISED. SECTION D ADDED. SECTION B-FOLTS ADDED.	17 JUN 05	DAB



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Section Chief
IFB No.: W911WN-05-B-0002
Sheet 23 of 30



OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
MISC. DETAILS

Drawing Number:
O-LEM-58/36.1

Symbol	Description	Date	Apr.

A REVISED SECTION "B" AND "C" ADDED SECTION "G".
: Emsworth Dams Rendb\Bulkheads\Structural\OLEM_S01

6121 Hanley Road, Columbus, Ohio 43228
User: borbarachsparks
Date: 18-JUN-2005 11:29
Plot Scale: 0.166667:1,000000
Pen Color: Color
Color Table: S835cat.S01

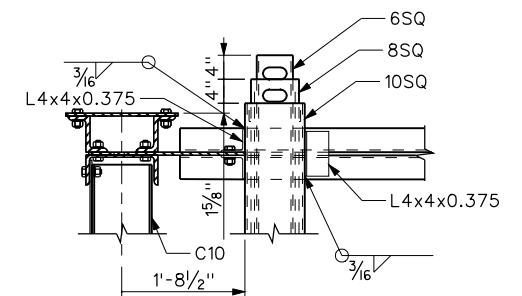
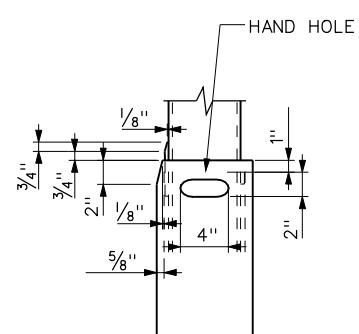
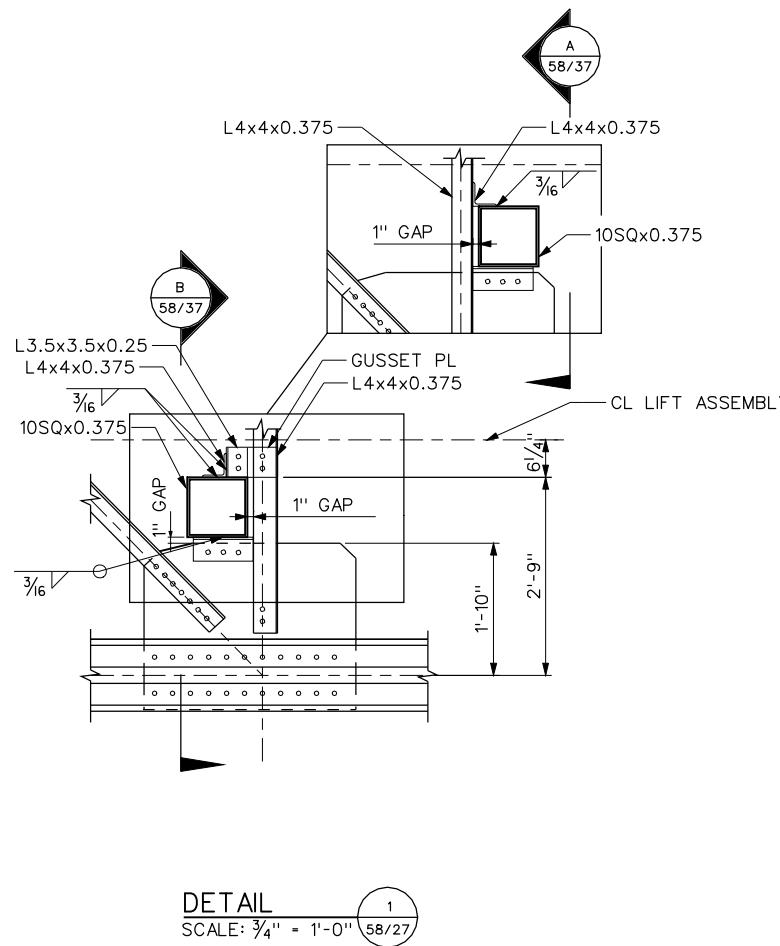
Design by:	CVP
Drawn by:	JAH
Checked by:	CDS
Submission Date:	17 JUNE 05
Revision Date:	



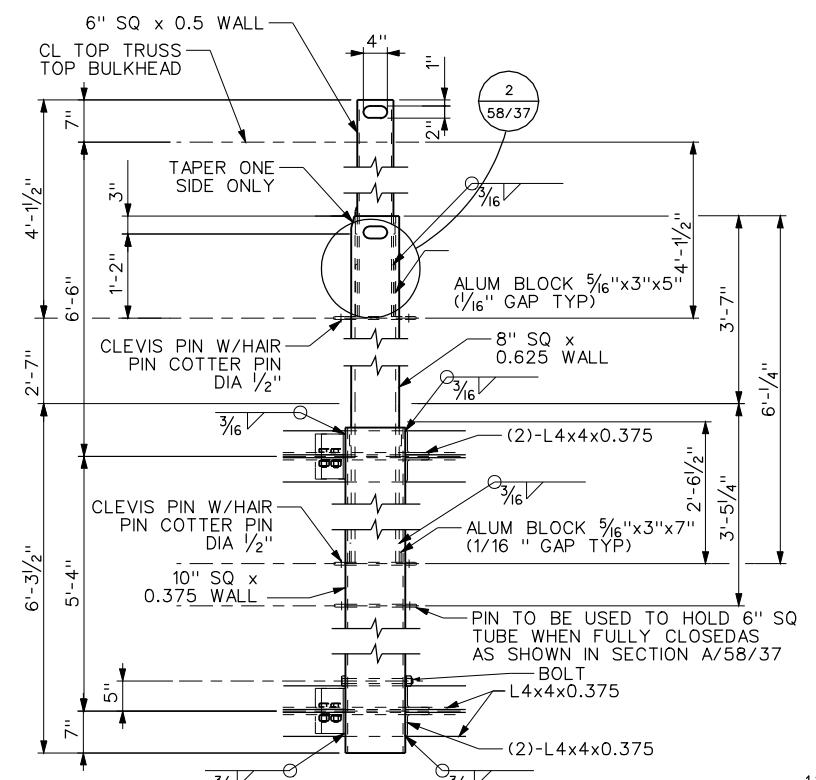
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Pittsburgh District**

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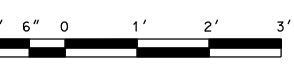
Submitted by:
 /s/ David A. Brittain
 SECTION CHIEF
 IFF NO.: W911WN-05-B-0002
 Sheet 24 of 30



SECTION A
SCALE: $\frac{3}{4}$ " = 1'-0" 58/37



SECTION
SCALE: $\frac{3}{4}$ " = 1'-0"  58/37 



SCALE: $\frac{3}{4}'' = 1'-0''$



CALE: 1-1/2'' = 1'-0"

A REVISED HANDBLUE.
F:\Emsworth Dams Rehab\Bulkheads\100:\Structural\OLEM_S

**OHIO RIVER
EMSWORTH DAMS**
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
SECTIONS & DETAILS
GUIDE BEAM

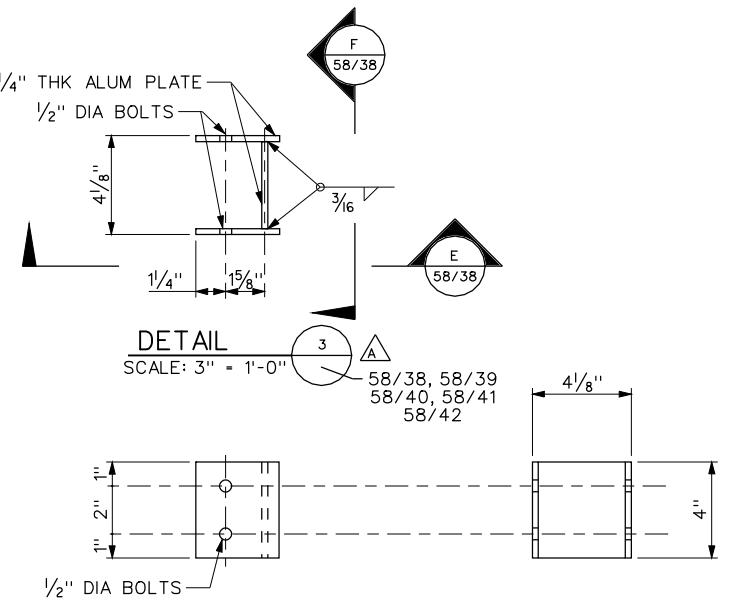
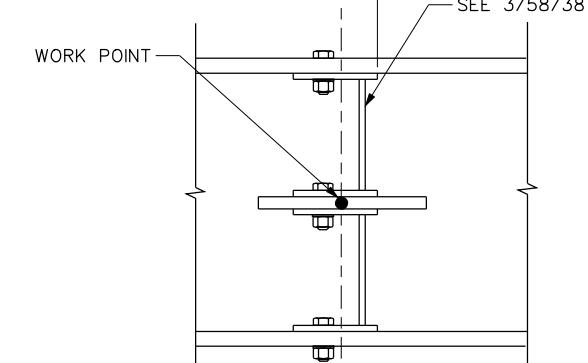
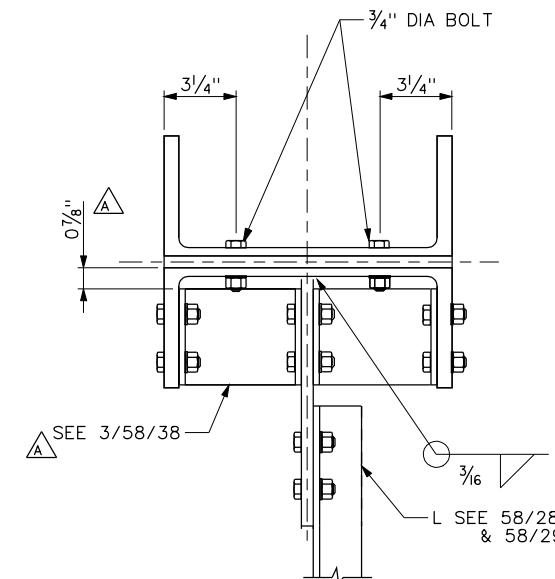
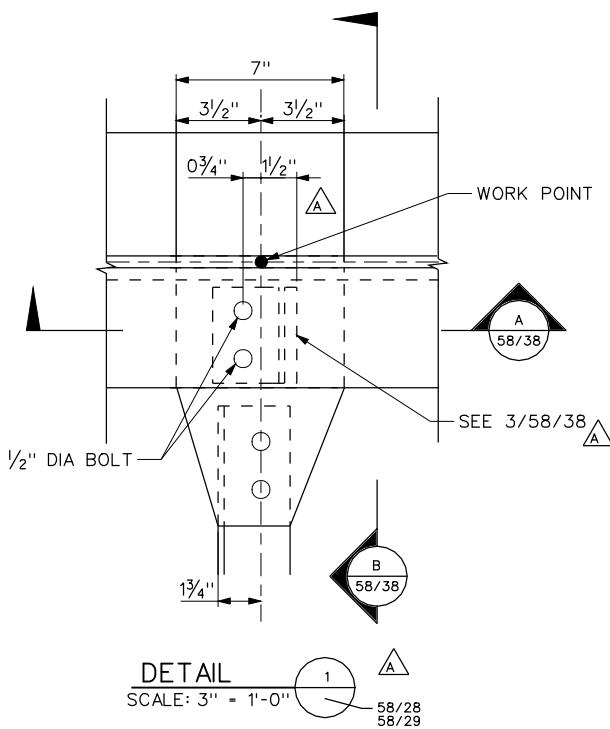


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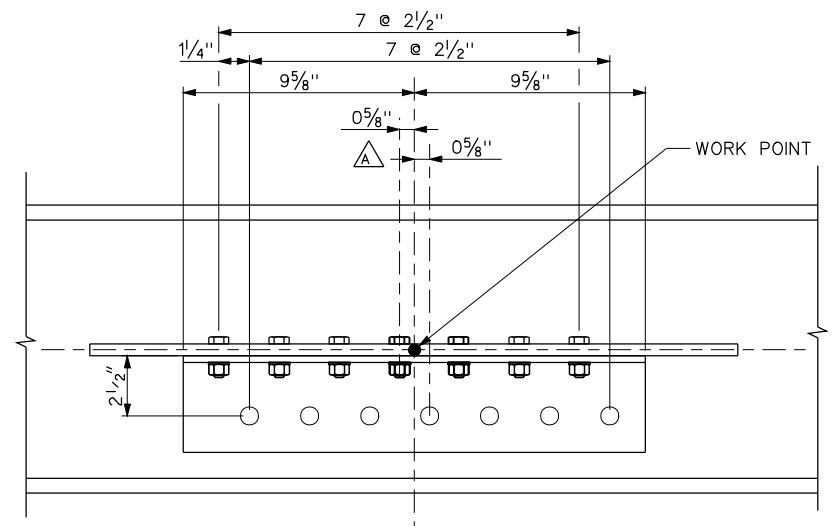
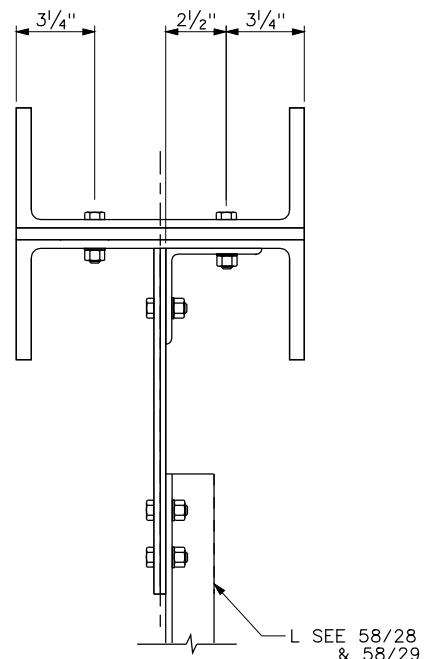
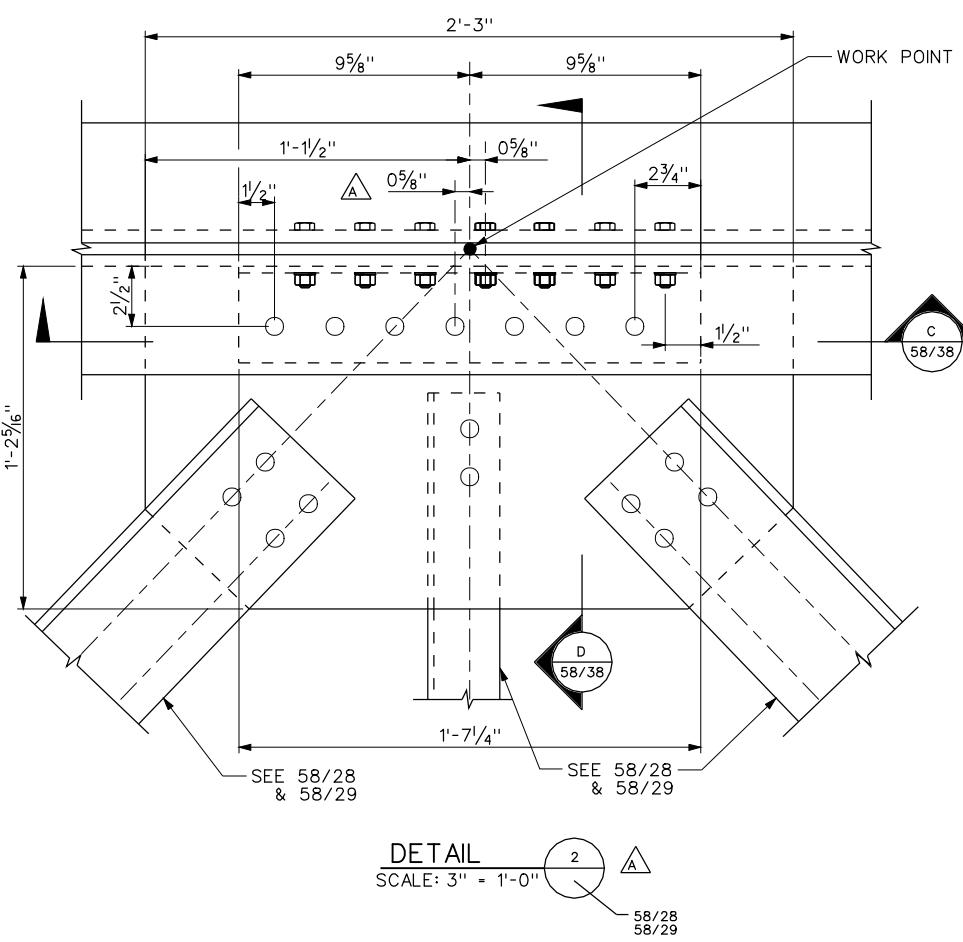
Submitted by: s/ David A. Brittain
SECTION CHIEF

IFB NO.: W91WN-05-B-0002
Sheet 25 of 30



DETAIL
SCALE: 3" = 1'-0" 58/28
58/29

SECTION
SCALE: 3" = 1'-0" 58/38



SECTION
SCALE: 3" = 1'-0" 58/38

SECTION
SCALE: 3" = 1'-0" 58/38

1' 6" 0' 1'
SCALE: 3" = 1'-0"

EDLZ
6121 Hanley Road, Columbus, Ohio 43228
User: borbara.hopkins
Date: 18-JUN-2005 11:29
Plot Scale: 0.066671:1000000
Pen Color: Color
Color Code: S835ca.S01

Symbol Description Date Apr.
A ADDITIONAL REFERENCES TO OTHER SHEETS.
ADDED SECTIONS E & F, DETAIL 3 AND CHANGED
DIMENSIONS IN SECTIONS A, B & C AND DETAILS 1 & 2
F:\\Emsworth Dams\\Renditions\\Bulkheads\\Structural\\OLEM_S01

OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
SECTIONS & DETAILS
FRAMING CONNECTIONS 1 OF 5



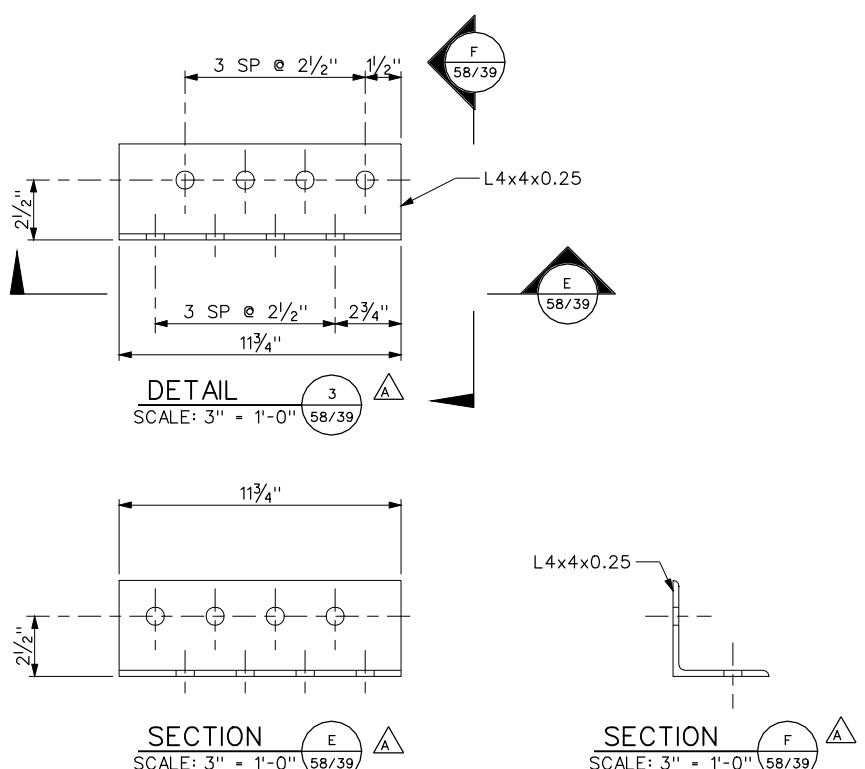
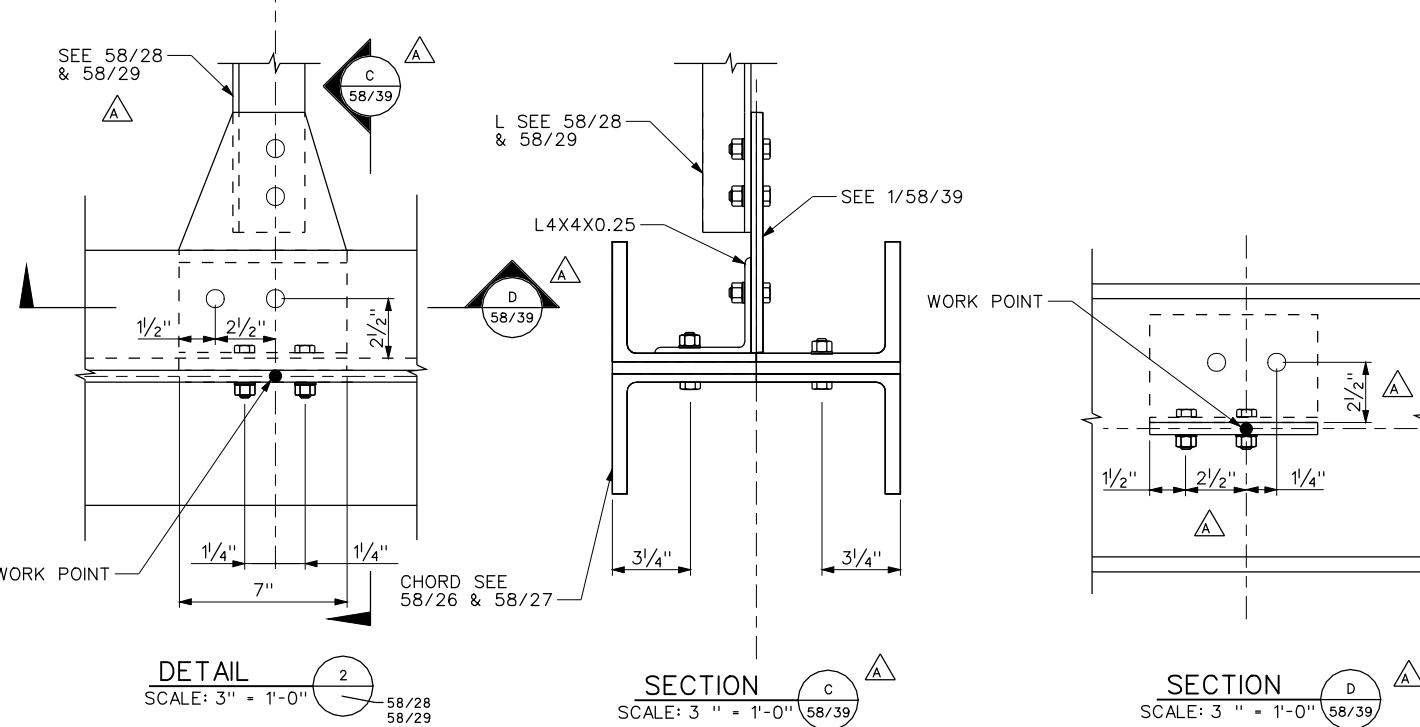
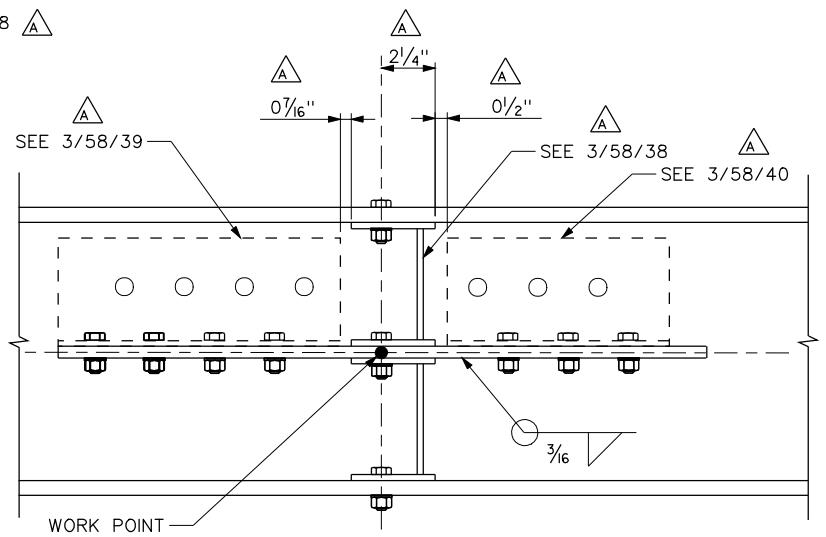
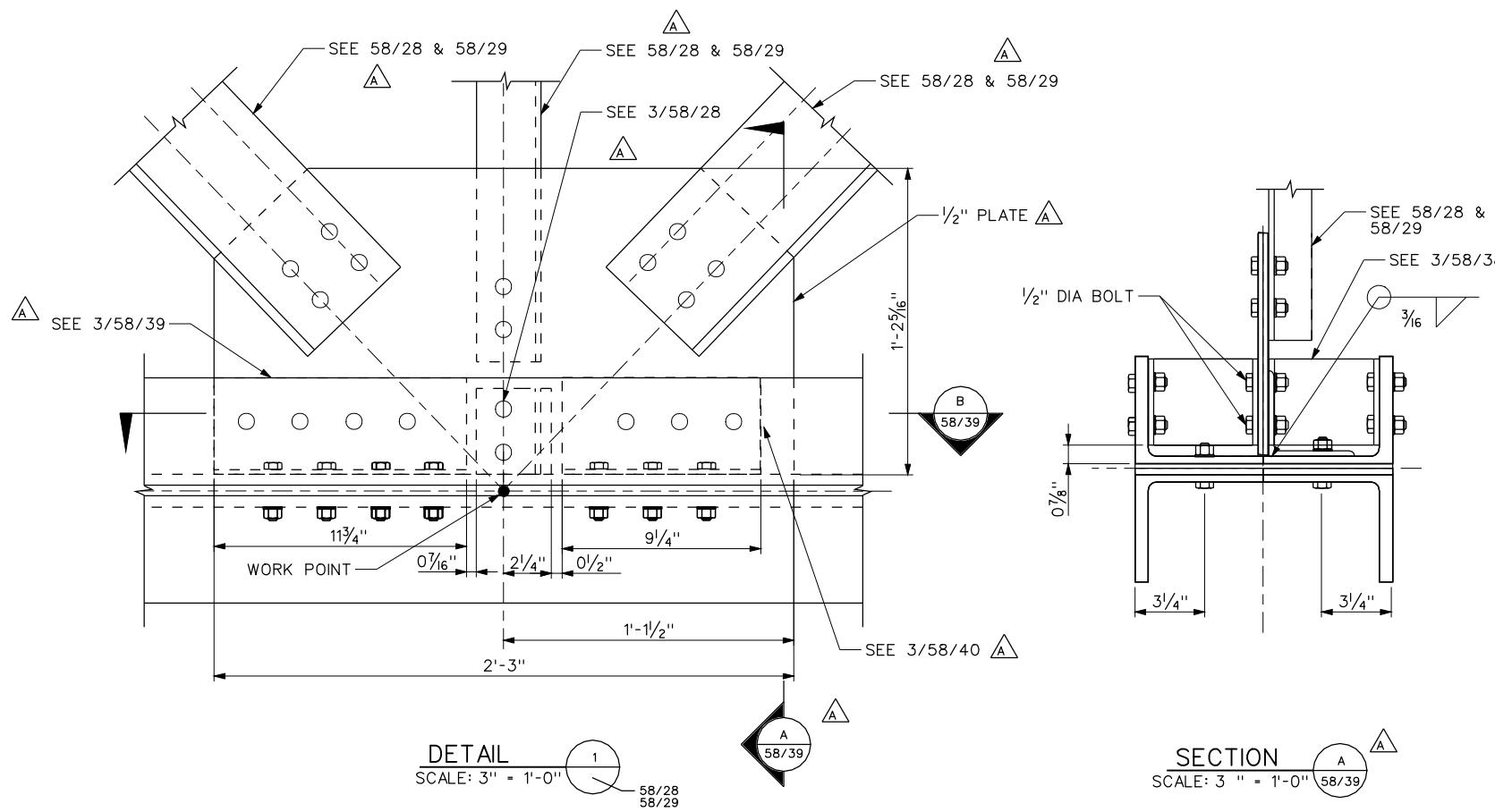
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Submitted by:
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SECTION CHIEF

IFB No.: W911WN-05-B-0002

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OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
SECTIONS & DETAILS
FRAMING CONNECTIONS 2 OF 5
Drawing Number: O-LEM-58/39.1



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Revision Date: 17 JUNE 05

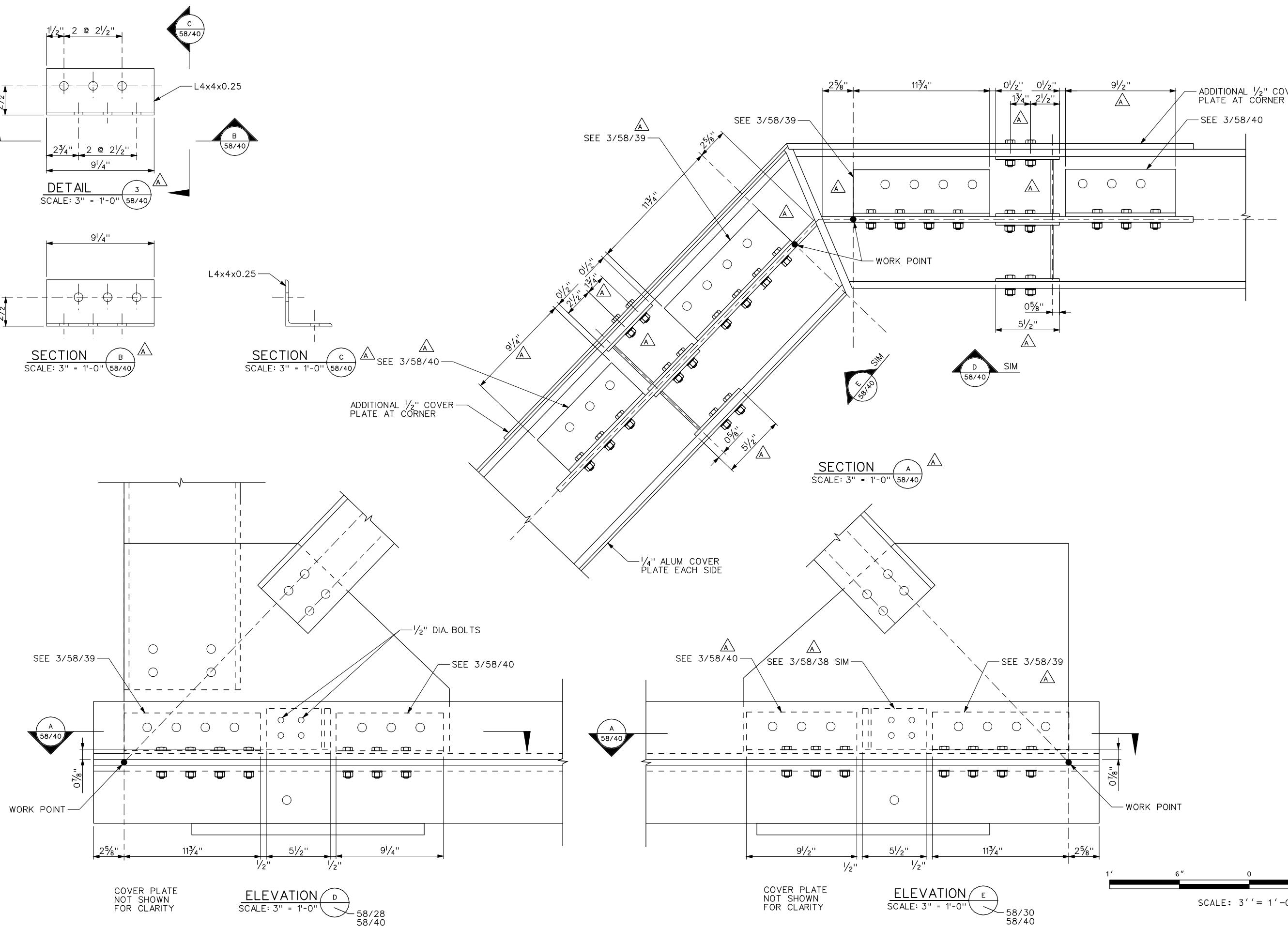
Sheet 27 of 30



Symbol	Description	Date	Apr.
A	ADDITIONAL REFERENCES TO OTHER SHEETS, SECTION DESIGNATIONS REVISED. ANGLE POSITIONING IN SECTION A REVISED. BRACING REVISED. ADDED SECTIONS "B", "C" AND DETAIL 3.	17 JUN 05	DAB

User: barbara.hopkins
Date: 18-JUN-2005 11:29
Plot Scale: 0.06661:1.000000
Pen Table: Color Table
Color Table: S840a.S01

OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
SECTIONS & DETAILS
FRAMING CONNECTIONS 3 OF 5
E:\\Emsworth Dams\\Renditions\\Bulkheads\\Structural\\OLEM_3
E:\\Emsworth Dams\\Renditions\\Bulkheads\\Structural\\OLEM_3



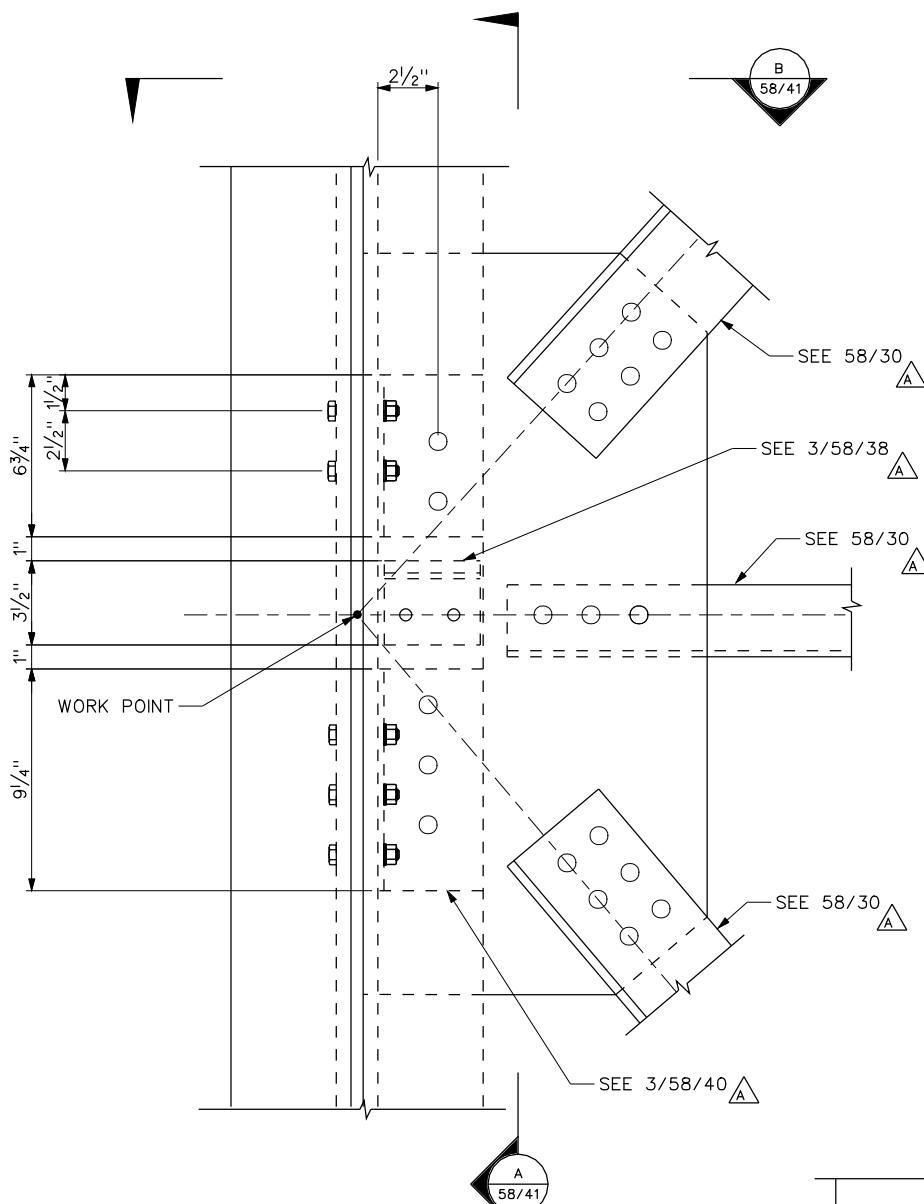


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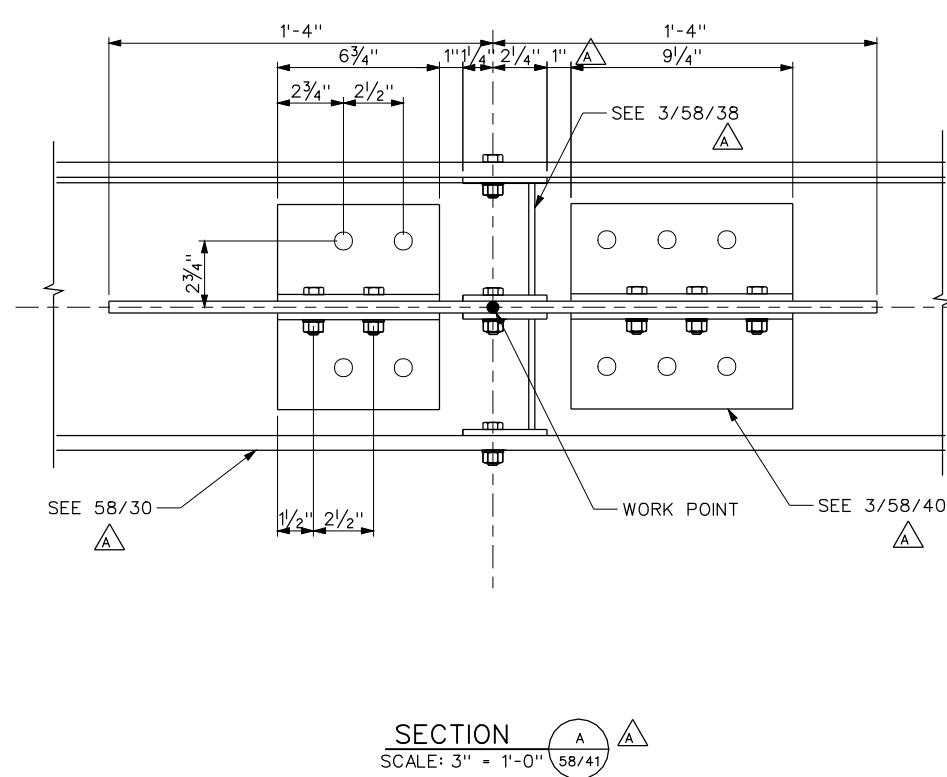
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Submitted by:	/s/ David A. Brittain	
SECTION CHIEF:		
IFB NO.:	W911WN-05-B-0002	
Submission Date:	17 JUNE 05	Revision Date:
Drawn by:	JAH	CDS:
Design by:	CVP	

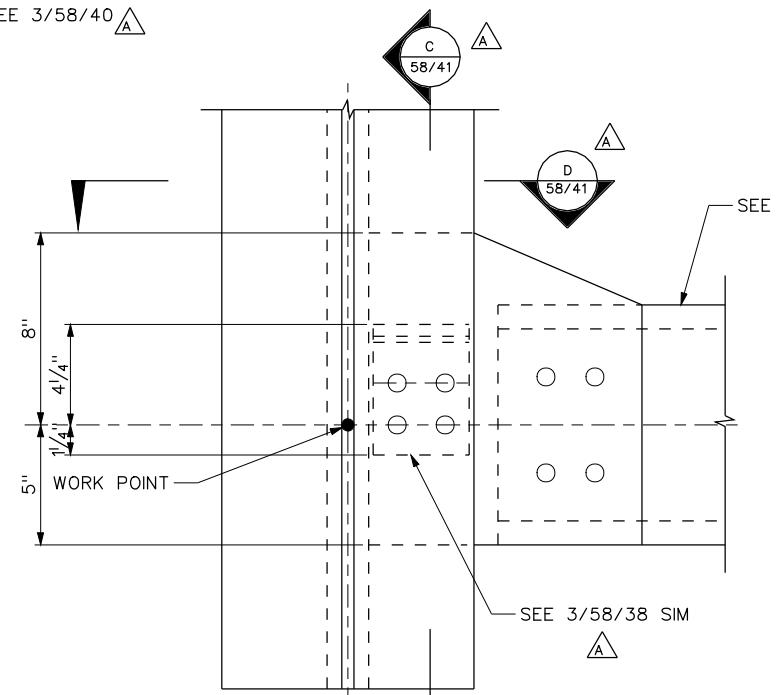
EDLZ
6121 Hanley Road, Columbus, Ohio 43228
User: borbara.hjephins
Date: 18-JUN-2005 11:29
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Pen Table:
Color Table:
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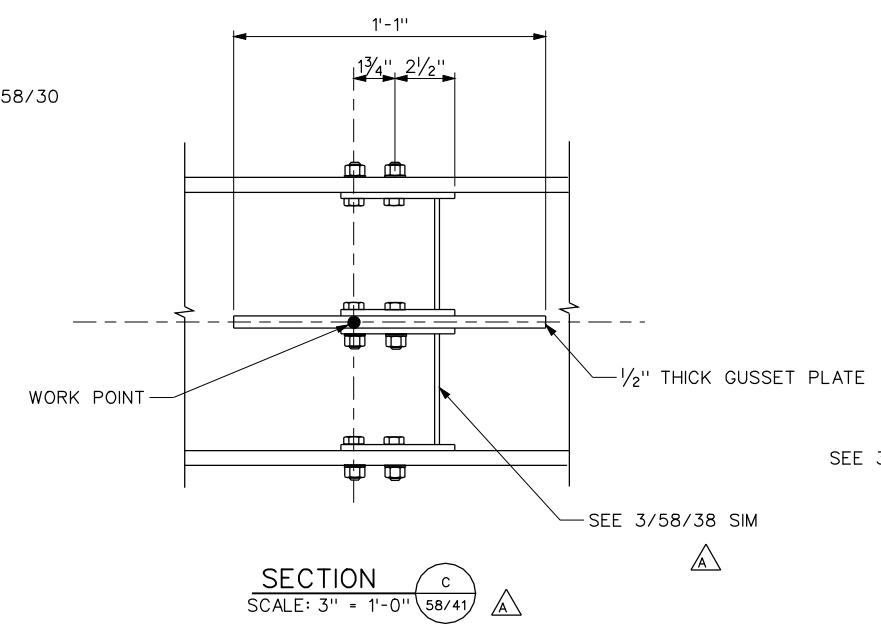
DETAIL
SCALE: 3" = 1'-0" 58/30



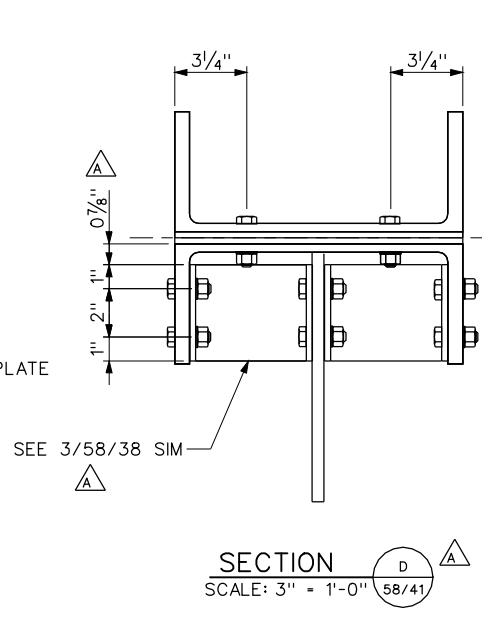
SECTION
SCALE: 3" = 1'-0" 58/41



DETAIL
SCALE: 3" = 1'-0" 58/30



SECTION
SCALE: 3" = 1'-0" 58/41



SECTION
SCALE: 3" = 1'-0" 58/41

1' 6" 0' 1'
SCALE: 3" = 1'-0"

OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
SECTIONS & DETAILS
FRAMING CONNECTIONS 4 OF 5
F:\\Emsworth Dams\\Rehds\\Bulkheads\\Structural\\OLEM_3
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Drawing Number:
O-LEM-58/41.1



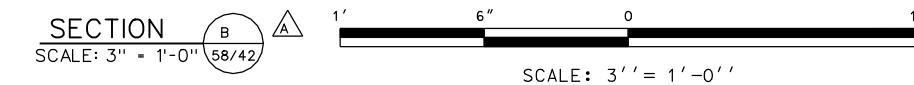
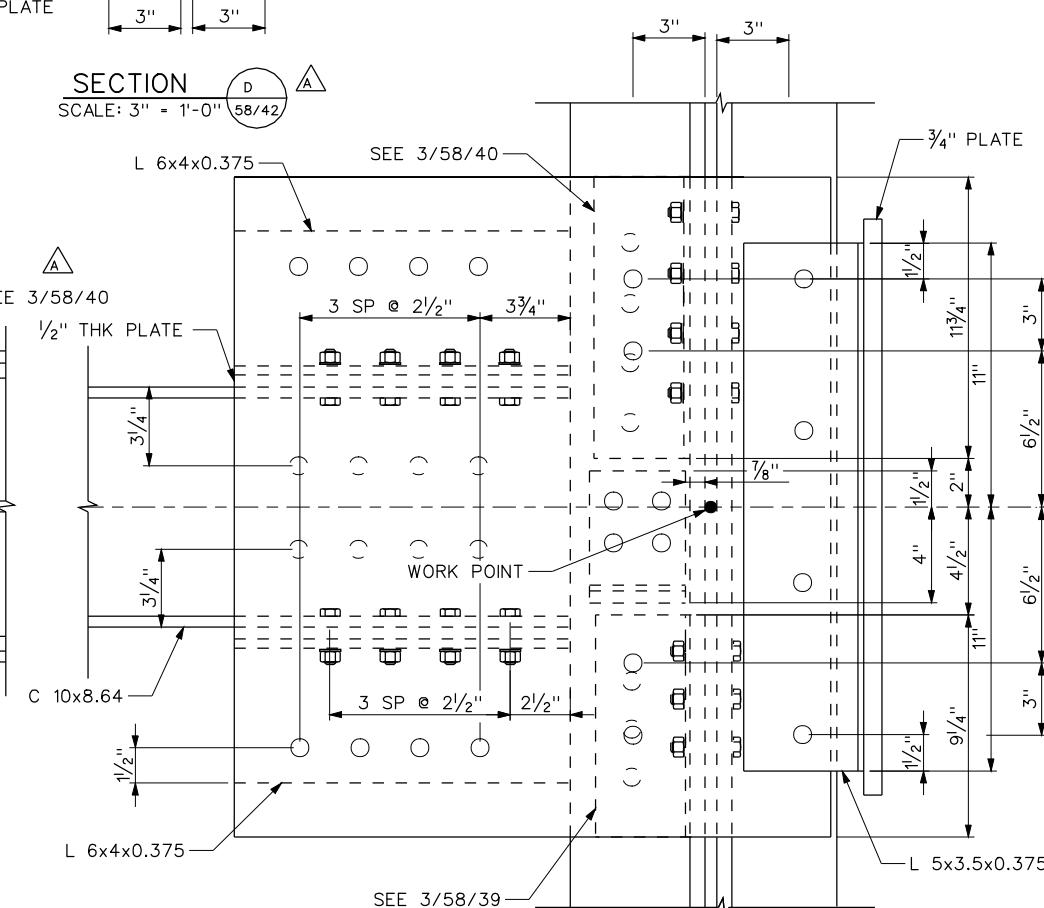
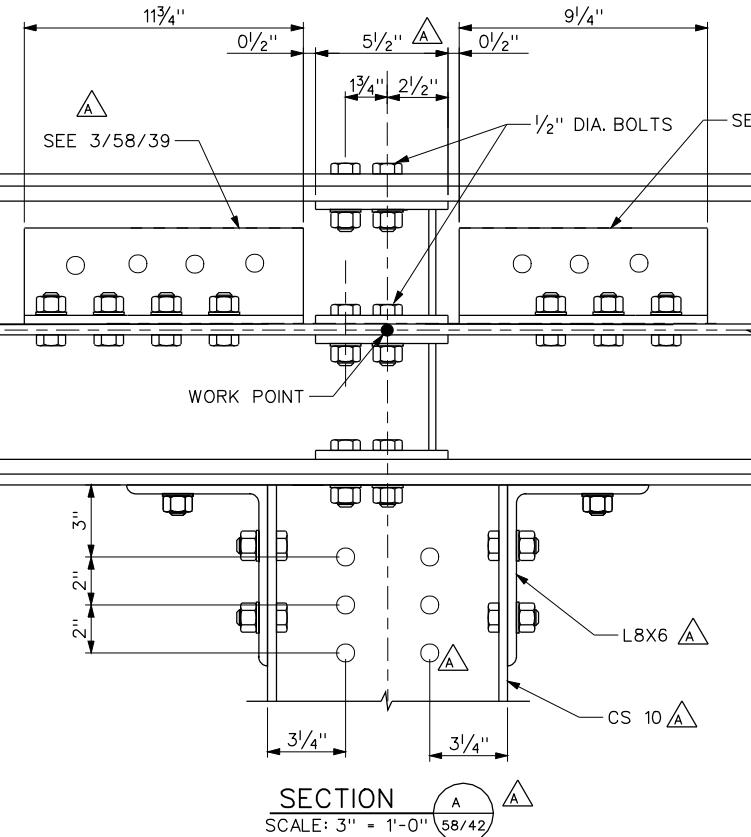
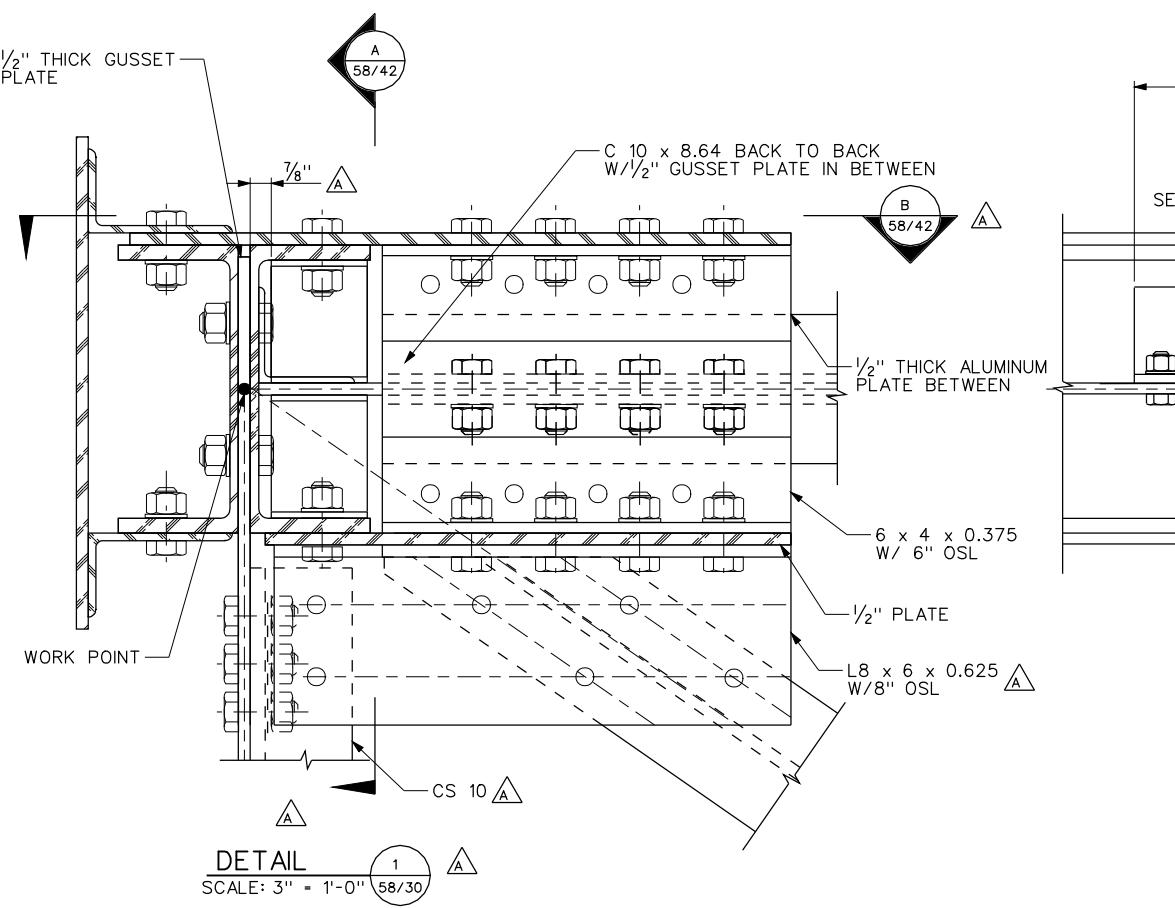
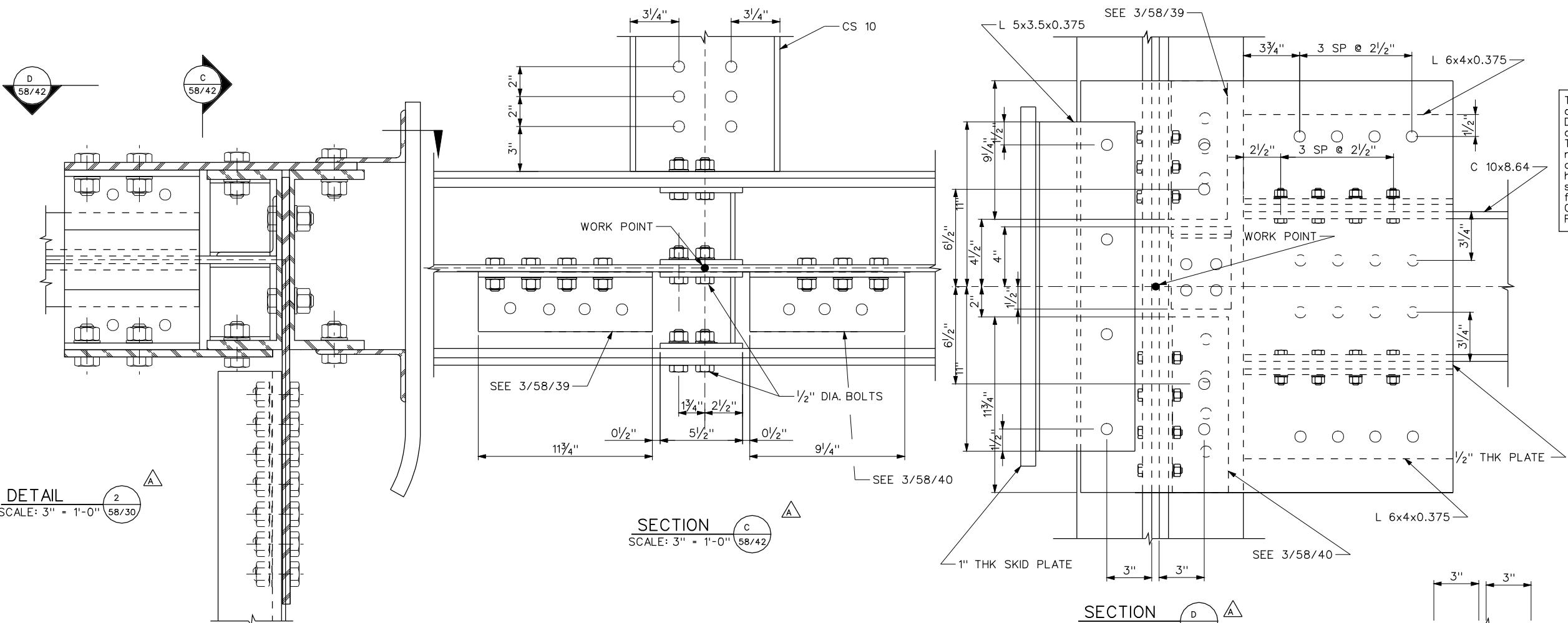
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EDLZ		Submitted by: <u>s/ David A. Brittain</u>	
6121 Hanley Road, Columbus, Ohio 43229 User Name: barbara.hopkins Pstl. Scrlr.: 18-JUN-2005 1129 Pstl. Scrlr.: 106867-10000000		SECTION CHIEF CVD Crd by: <u>CDS</u>	
Design by: <u>JAH</u>	Down by: <u>JAH</u>	Submission Date: 17 JUNE 05	IB NO.: W91WN-05-B-0002
		Sheet 29 of 30	

Symbol	Description	Date	Appr.
A	SECTION DESIGNATIONS REVISED. SECTION "A" BRACING POSITIONING CHANGED. DETAIL 2 AND SECTIONS B,C AND D ADDED. BOLTS IN SECTION "A" REVISED. DETAIL 1 ANGLES REVISED.	17 JUN 05	DAB

F:\Emsworth Dams\Rehab\Bulkheads\100\Structural\OLEM





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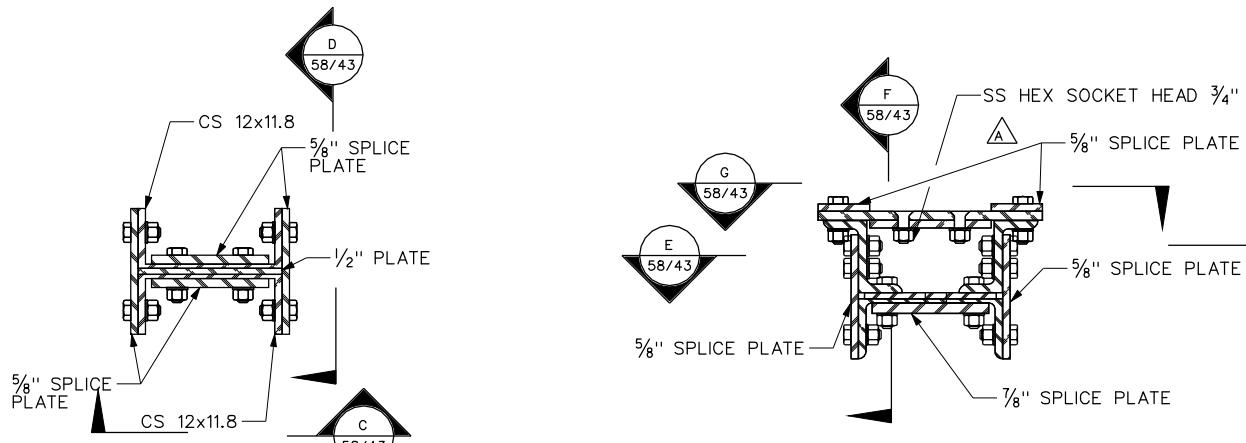
Submitted by:	s/ David A. Brittain
SECTION CHIEF:	
IFB NO.:	W911WN-05-B-0002
Revision Date:	17 JUNE 05

Design by:	CVP
Drawn by:	JAH
Cd by:	CDS
Submission Date:	

EDLZ	6121 Hanley Road, Columbus, Ohio 43228
User: barbara.hopkins	Date: 18-JUN-2005 11:29
Plot Scale: 1:66661:1000000	Pen: table
Color: table	584-30-301

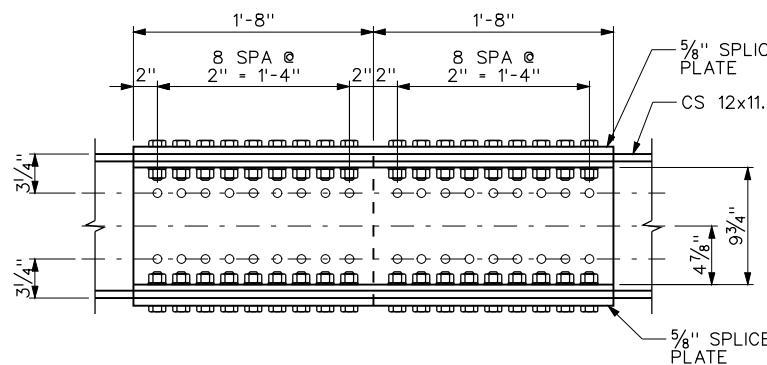
Symbol	Description
A	REVISED DETAIL DESIGNATIONS, SECTIONS B-G & ELEVATION F-SPLICE PLATE REVISED, SECTION E & G-BOLT LOCATIONS REVISED, SECTION B- BOLT TYPE REVISED.

OHIO RIVER
EMSWORTH DAMS
FABRICATION OF EMERGENCY BULKHEADS
EMERGENCY BULKHEADS
SECTIONS & DETAILS
SPLICE PLATES

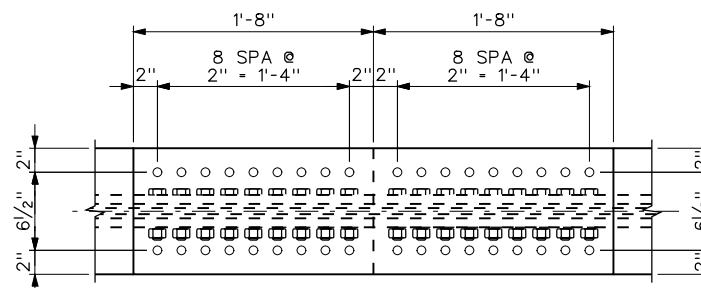


SECTION
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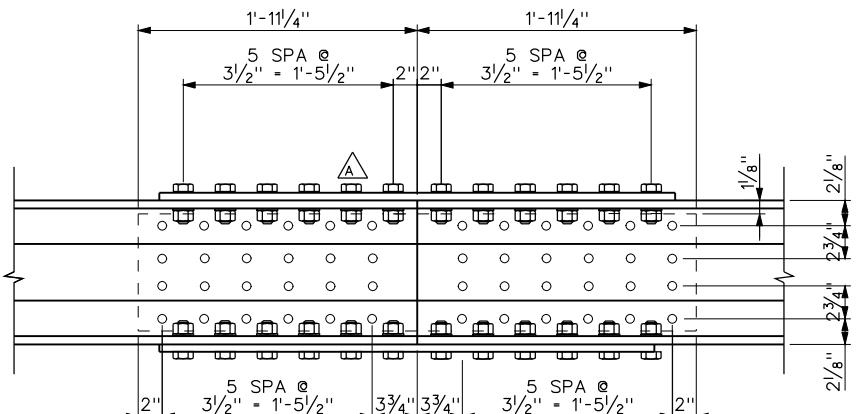
SECTION
SCALE: 1/2" = 1'-0" 58/26



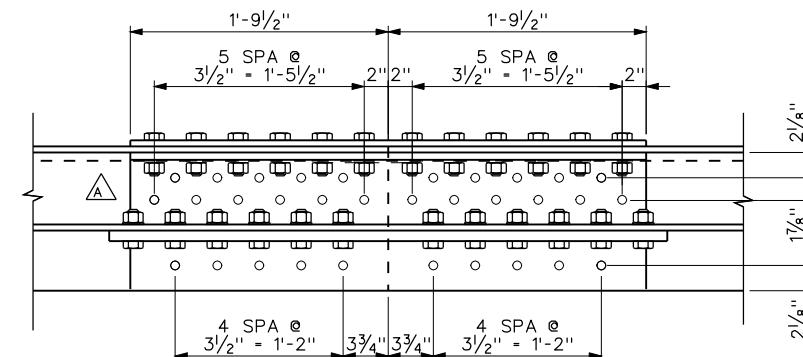
SECTION
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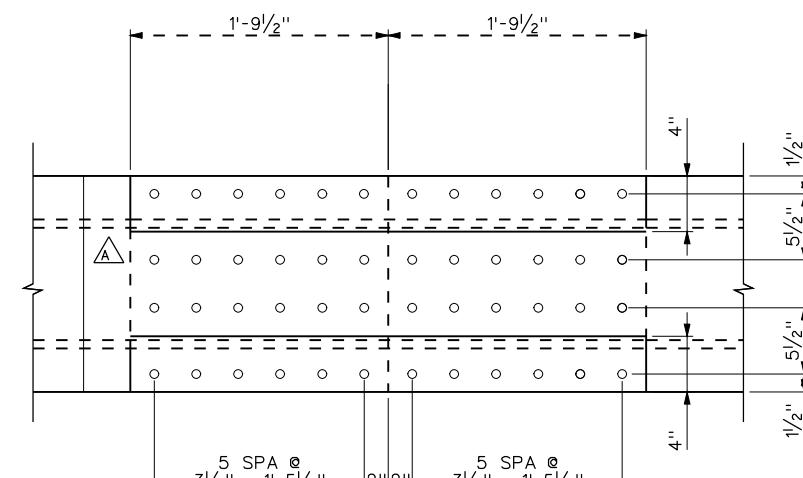
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SCALE: 1/2" = 1'-0" 58/43



SECTION
SCALE: 1/2" = 1'-0" 58/43



ELEVATION
SCALE: 1/2" = 1'-0" 58/43



SECTION
SCALE: 1/2" = 1'-0" 58/43

